#### **Final**

## Total Maximum Daily Load for <u>E</u>. <u>coli</u> 22 Stream Segments within the Beaver Creek Watershed Floyd and Knott Counties, Kentucky September, 2010

Submitted to: United States Environmental Protection Agency Region IV Atlanta Federal Building 61 Forsyth Street SW Atlanta, GA 30303-1534

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### **Kentucky Department for Environmental Protection Division of Water**

This report is approved for release

Sandra L. Gruzesky, P.L., Director Division of Water

9/10/10

Date



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#### **Glossary of Acronyms**

| ADD        | Area Development District   |
|------------|---|
| AFO        | Animal Feeding Operation  |
| AWQA       | Agriculture Water Quality Act   |
| BMP        | Best Management Practices   |
| CAFO       | Confined Animal Feeding Operation   |
| CFR        | Code of Federal Regulations   |
| CPP        | Continuing Planning Process   |
| CSO        | Combined Sewer Overflow   |
| DMR        | Discharge Monitoring Report   |
| GNIS       | Geographic Names Information System   |
| HUC        | Hydrologic Unit Code  |
| KAR        | Kentucky Administrative Regulations   |
| KDOW       | Kentucky Division of Water  |
| KGS        | Kentucky Geological Survey  |
| KRS        | Kentucky Revised Statutes   |
| KIA        | Kentucky Infrastructure Authority   |
| KNDOP      | Kentucky No Discharge Operating Permit  |
| KPDES      | Kentucky Pollution Discharge Elimination System                                 |
| LA         | Load Allocations  |
| LTCP       | Long Term Control Plan  |
| MAF        | Mean Annual Flow  |
| MGD        | Million Gallons per Day   |
| MOS<br>MS4 | Margin of Safety  Municipal Separate Storm Server Systems                       |
| NASS       | Municipal Separate Storm Sewer Systems National Agricultural Statistics Service |
| NLCD       | National Land Cover Database  |
| NRCS       | Natural Resources Conservation Service  |
| OSTDS      | On Site Sewage Treatment and Disposal System                                    |
| PCR        | Primary Contact Recreation  |
| POTW       | Publicly Owned Treatment Works  |
| RM         | River Mile  |
| SCR        | Secondary Contact Recreation  |
| SOP        | Standard Operating Procedures   |
|            |   |
| STP        | Sewage Treatment Plant  |
| TMDL       | Total Maximum Daily Load  |
| USDA       | United States Department of Agriculture   |
| USEPA      | United States Environmental Protection Agency                                   |
| USGS       | United States Geological Survey   |
| WBID       | Waterbody Identification Number   |
| WLA        | Waste Load Allocation   |
| WQC        | Water Quality Criteria  |
| WQS        | Water Quality Standard  |
| WWTP       | Wastewater Treatment Plant  |
| 11 11 11   | reasonater froutment runt   |

#### **Total Maximum Daily Load Synopsis**

State: Kentucky

Major River Basin: Big Sandy USGS HUC8: 05070203

Counties: Floyd and Knott

**Impaired Use(s):** Primary and Secondary Contact Recreation

Pollutants of Concern: Fecal Coliform, E. coli

The Beaver Creek Watershed is located in the Big Sandy River Basin in Floyd and Knott Counties and encompasses the cities of Wheelwright and Pippa Passes in its headwaters, Wayland in its midst, and Martin and Allen near its confluence with Levisa Fork. A map depicting the location of the Beaver Creek Watershed is in Figure S.1.

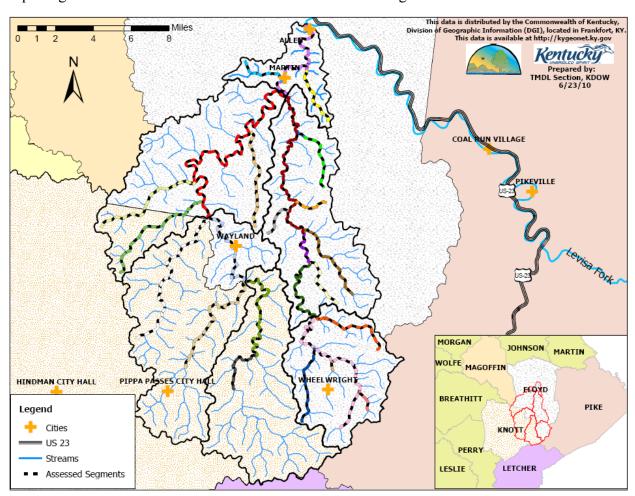


Figure S.1 Location of Beaver Creek Watershed in Floyd and Knott Counties of Eastern KY

The Kentucky Division of Water (KDOW) contracted with Eastern Kentucky University (EKU) to monitor for Escherichia coli (a pathogen indicator) in the Beaver Creek watershed, including the Right Fork and Left Fork of Beaver Creek and their major tributaries. This sampling was performed by the students and staff of the Eastern Kentucky Environmental Research Institute at EKU under the direction of Dr. Alice Jones and Environmental Specialist Reagan Butcher. This

document contains the monitoring results and describes TMDL development for pathogen indicators in the Beaver Creek watershed as required under Section 303(d) of the Clean Water Act. Table S.1 indicates the pathogen indicator impaired segments for which TMDLs are developed in this document.

Table S.1 Impaired Waterbodies Addressed in this TMDL Document

|              |         | Waterboules A | daressea |            | L Docui |                    |  |
|--------------|---------|---------------|----------|------------|---------|--------------------|--|
| Waterbody    | Total   | W 4 1 1 ID    | G 1      | Assessment | T T     | T                  | G (1G ()                               |
| & Segment    | Size    | Waterbody ID  | County   | Category   | Use     | Impairment         | Suspected Source(s)                    |
|              |         |               |          |            |         |                    | On-Site Treatment                      |
| Arkansas     |         |               |          |            |         |                    | Systems (Septic                        |
| Creek 0.0 to | 3.6     |               |          |            |         | <u>Escherichia</u> | Systems and Similar                    |
| 3.6          | miles   | KY486027_01   | Floyd    | 5-NS       | PCR     | <u>coli</u>        | Decentralized Systems)                 |
|              |         |               |          |            |         |                    | Municipal (Urbanized                   |
|              |         |               |          |            |         |                    | High Density Area),                    |
|              |         |               |          |            |         |                    | On-Site Treatment                      |
|              |         |               |          |            |         |                    | Systems (Septic                        |
|              |         |               |          |            |         |                    | Systems and Similar                    |
|              |         |               |          |            |         |                    | Decentralized                          |
|              |         |               |          |            |         |                    | Systems), Package                      |
|              |         |               |          |            |         |                    | Plant or Other                         |
|              |         |               |          |            |         |                    | Permitted Small Flows                  |
| Beaver       |         |               |          |            |         |                    | Discharges,                            |
| Creek 0.0 to | 7.1     |               |          |            |         | <b>Escherichia</b> | Unspecified Domestic                   |
| 7.1          | miles   | KY486610 01   | Floyd    | 5-NS       | PCR     | coli               | Waste                                  |
|              |         | _             |          |            |         | <del></del>        | On-Site Treatment                      |
|              |         |               |          |            |         |                    | Systems (Septic                        |
| Buck Branch  | 2.8     |               |          |            |         | Escherichia        | Systems and Similar                    |
| 0.0 to 2.8   | miles   | KY488192 01   | Floyd    | 5-NS       | PCR     | coli               | Decentralized Systems)                 |
|              |         |               | - J      |            |         |                    | On-Site Treatment                      |
|              |         |               |          |            |         |                    | Systems (Septic                        |
| Caleb Fork   | 1.2     |               |          |            |         | Escherichia        | Systems and Similar                    |
| 0.0 to 1.2   | miles   | KY488598 01   | Floyd    | 5-NS       | PCR     | coli               | Decentralized Systems)                 |
|              |         |               |          | 0 1.00     |         |                    | Package Plant or Other                 |
| Caney Fork   | 7.5     |               |          |            |         | Escherichia        | Permitted Small Flows                  |
| 0.0 to 7.5   | miles   | KY488862 01   | Knott    | 5-NS       | PCR     | coli               | Discharges                             |
| 0.0 00 7.0   | 1111105 | 111 100002_01 | 1111011  | 0 110      | 1010    | <u> </u>           | On-Site Treatment                      |
|              |         |               |          |            |         |                    | Systems (Septic                        |
| Clear Creek  | 4.9     |               |          |            |         | Escherichia        | Systems and Similar                    |
| 0.0 to 4.9   | miles   | KY489611 01   | Floyd    | 5-NS       | PCR     | coli               | Decentralized Systems)                 |
| 0.0 to 1.5   | miles   | 161 109011_01 | 11094    | 3 110      | TOR     | 2011               | On-Site Treatment                      |
|              |         |               |          |            |         |                    | Systems (Septic                        |
|              |         |               |          |            |         |                    | Systems (Septic<br>Systems and Similar |
|              |         |               |          |            |         |                    | Decentralized                          |
|              |         |               |          |            |         |                    | Systems), Package                      |
| Frasure      |         |               |          |            |         |                    | Plant or Other                         |
| Creek 0.0 to | 5.2     |               |          |            |         | Escherichia        | Permitted Small Flows                  |
| 5.2          | miles   | KY492468 01   | Floyd    | 5-NS       | PCR     | coli               | Discharges                             |
| J.L          | mics    | K1492400_01   | Tioyu    | J-110      | ICK     | 2011               | On-Site Treatment                      |
|              |         |               |          |            |         |                    | Systems (Septic                        |
| Jacks Creek  | 4.4     |               |          |            |         | Escherichia        | Systems and Similar                    |
|              |         | KY495089 01   | Floyd    | 5-NS       | PCR     |                    | Decentralized Systems)                 |
| 0.0 to 4.4   | miles   | K 1493U89_U1  | rioya    | D-IND      | rck     | <u>coli</u>        | Decemanzed Systems)                    |

| Waterbody    | Total   |              |          | Assessment   |      |                    |  |
|--------------|---------|--------------|----------|--------------|------|--------------------|--|
| & Segment    | Size    | Waterbody ID | County   | Category     | Use  | Impairment         | Suspected Source(s)                    |
| ee Segment   | SIZC    | wateroody 12 | County   | cutegory     | 0.50 | Impuniment         | On-Site Treatment                      |
|              |         |              |          |              |      |                    | Systems (Septic                        |
| Jones Fork   | 9.9     |              |          |              |      | Escherichia        | Systems and Similar                    |
| 0.0 to 9.9   | miles   | KY495499 01  | Knott    | 5-NS         | PCR  | coli               | Decentralized Systems)                 |
| 0.0 10 9.9   | IIIICS  | K1493499_01  | Kilott   | 3-110        | ICK  | <u>con</u>         | On-Site Treatment                      |
|              |         |              |          |              |      |                    |  |
|              |         |              |          |              |      |                    | Systems (Septic                        |
|              |         |              |          |              |      |                    | Systems and Similar Decentralized      |
| Left Fork    |         |              |          |              |      |                    | Systems), Package                      |
| Beaver       |         |              |          |              |      |                    | Plant or Other                         |
| Creek 0.0 to | 11.4    |              |          |              |      | Escherichia        | Permitted Small Flows                  |
| 11.4         | miles   | KY496194 01  | Floyd    | 5-NS         | PCR  | coli               | Discharges                             |
| 11.4         | iiiies  | K1490194_01  | rioyu    | 3-113        | FCK  | COII               | On-Site Treatment                      |
|              |         |              |          |              |      |                    |  |
|              |         |              |          |              |      |                    | Systems (Septic                        |
|              |         |              |          |              |      |                    | Systems and Similar<br>Decentralized   |
| Left Fork    |         |              |          |              |      |                    | Systems), Package                      |
| Beaver       |         |              |          |              |      |                    | Systems), Package Plant or Other       |
| Creek 11.4   | 2.15    |              |          |              |      | Escherichia        | Permitted Small Flows                  |
| to 13.55     | miles   | KY496194 02  | Floyd    | 5-NS         | PCR  | coli               | Discharges                             |
| Left Fork    | IIIIIes | K1490194_02  | rioyu    | 3-113        | TCK  | COII               | On-Site Treatment                      |
| Beaver       |         |              |          |              |      |                    | Systems (Septic                        |
| Creek 18.7   | 5.3     |              |          |              |      | Escherichia        | Systems (Septic<br>Systems and Similar |
| to 28.6      | miles   | KY496194 04  | Floyd    | 5-NS         | PCR  | coli               | Decentralized Systems)                 |
| 10 20.0      | IIIICS  | K1490194_04  | rioyu    | 3-113        | TCK  | COII               | Package Plant or Other                 |
| Otter Creek  | 0.5     |              |          |              |      | Escherichia        | Permitted Small Flows                  |
| 0.0 to 0.5   | miles   | KY500021 01  | Floyd    | 5-NS         | PCR  | coli               | Discharges                             |
| Right Fork   | IIIICS  | K1300021_01  | 1 10 y u | 3-110        | TCK  | <u>con</u>         | Discharges                             |
| Beaver       |         |              |          |              |      | Escherichia        |  |
| Creek 0.0 to | 17.4    |              |          |              | PCR, | coli, Fecal        | Inappropriate Waste                    |
| 17.4         | miles   | KY501863 01  | Floyd    | 5-NS, 5-NS   | SCR  | coliform           | Disposal                               |
| 17.4         | 1111103 | K1301003_01  | Tioyu    | 3 115, 3 115 | ber  | COMOTH             | On-Site Treatment                      |
|              |         |              |          |              |      |                    | Systems (Septic                        |
|              |         |              |          |              |      |                    | Systems (Septier Systems and Similar   |
|              |         |              |          |              |      |                    | Decentralized                          |
| Right Fork   |         |              |          |              |      |                    | Systems), Package                      |
| Beaver       |         |              |          |              |      |                    | Plant or Other                         |
| Creek 17.4   | 5.9     |              |          |              |      | Escherichia        | Permitted Small Flows                  |
| to 23.3      | miles   | KY501863 02  | Floyd    | 5-NS         | PCR  | coli               | Discharges                             |
|              |         |              | - ,      |              |      |                    | On-Site Treatment                      |
|              |         |              |          |              |      |                    | Systems (Septic                        |
|              |         |              |          |              |      |                    | Systems and Similar                    |
|              |         |              |          |              |      |                    | Decentralized                          |
| Right Fork   |         |              |          |              |      |                    | Systems), Package                      |
| Beaver       |         |              |          |              |      |                    | Plant or Other                         |
| Creek 30.3   | 2.9     |              |          |              |      | <u>Escherichia</u> | Permitted Small Flows                  |
| to 33.4      | miles   | KY501863_04  | Knott    | 5-NS         | PCR  | coli               | Discharges                             |
|              |         | _            |          |              |      |                    | On-Site Treatment                      |
| Salt Lick    |         |              |          |              |      |                    | Systems (Septic                        |
| Creek 0.0 to | 6.8     |              |          |              |      | <b>Escherichia</b> | Systems and Similar                    |
| 6.8          | miles   | KY502845_01  | Floyd    | 5-NS         | PCR  | <u>coli</u>        | Decentralized Systems)                 |

| Waterbody    | Total |              |        | Assessment |     |                    |                        |
|--------------|-------|--------------|--------|------------|-----|--------------------|------------------------|
| & Segment    | Size  | Waterbody ID | County | Category   | Use | Impairment         | Suspected Source(s)    |
|              |       |              |        |            |     |                    | On-Site Treatment      |
| Simpson      |       |              |        |            |     |                    | Systems (Septic        |
| Branch 0.0   | 1.8   |              |        |            |     | <b>Escherichia</b> | Systems and Similar    |
| to 1.8       | miles | KY503532_01  | Floyd  | 5-NS       | PCR | <u>coli</u>        | Decentralized Systems) |
|              |       |              |        |            |     |                    | On-Site Treatment      |
| Sizemore     |       |              |        |            |     |                    | Systems (Septic        |
| Branch 0.0   | 2     |              |        |            |     | <u>Escherichia</u> | Systems and Similar    |
| to 2.0       | miles | KY503590_01  | Floyd  | 5-NS       | PCR | <u>coli</u>        | Decentralized Systems) |
| Spewing      |       |              |        |            |     |                    | On-Site Treatment      |
| Camp         |       |              |        |            |     |                    | Systems (Septic        |
| Branch 0.0   | 3.1   |              |        |            |     | <u>Escherichia</u> | Systems and Similar    |
| to 3.1       | miles | KY504061_01  | Floyd  | 5-PS       | PCR | <u>coli</u>        | Decentralized Systems) |
|              |       |              |        |            |     |                    | On-Site Treatment      |
| Spurlock     |       |              |        |            |     |                    | Systems (Septic        |
| Creek 0.0 to | 0.6   |              |        |            |     | <u>Escherichia</u> | Systems and Similar    |
| 0.6          | miles | KY504191_01  | Floyd  | 5-NS       | PCR | <u>coli</u>        | Decentralized Systems) |
|              |       |              |        |            |     |                    | On-Site Treatment      |
| Turkey       |       |              |        |            |     |                    | Systems (Septic        |
| Creek 0.0 to | 5.9   |              |        |            |     | <b>Escherichia</b> | Systems and Similar    |
| 5.9          | miles | KY505598_01  | Floyd  | 5-NS       | PCR | <u>coli</u>        | Decentralized Systems) |

#### **Kentucky Water Quality Criteria (WQC):**

According to 401 KAR 10:031,

"The following criteria shall apply to waters designated as primary contact recreation use during the primary contact recreation season of May 1 through October 31: Fecal coliform content or <u>Escherichia coli</u> content shall not exceed 200 colonies per 100 ml or 130 colonies per 100 ml respectively as a geometric mean based on not less than five (5) samples taken during a thirty (30) day period. Content also shall not exceed 400 colonies per 100 ml in twenty (20) percent or more of all samples taken during a thirty (30) day period for fecal coliform or 240 colonies per 100 ml for <u>Escherichia coli</u>."

Additionally,

"The following criteria shall apply to waters designated for secondary contact recreation use during the entire year: Fecal coliform content shall not exceed 1000 colonies per 100 ml as a thirty (30) day geometric mean based on not less than five (5) samples; nor exceed 2000 colonies per 100 ml in twenty (20) percent or more of all samples taken during a thirty (30) day period."

#### **TMDL Components and Target:**

A TMDL calculation is performed as follows:

TMDL = WLA + LA + MOS

Where:

TMDL = the Water Quality Criterion. This is defined as an instantaneous  $\underline{E}$ .  $\underline{coli}$  concentration of 240 colonies/100 ml.

WLA = the Waste Load Allocation. For this TMDL document, there are two types of WLAs: WLAs for KPDES-permitted sources and a Future Growth WLA. The KPDES-permitted WLAs are allowable loadings of pollutants into the stream from KPDES-permitted sources such as sewage treatment plants, package plants, and home units. The Future Growth WLA is a portion of the loading reserved for expanding and new KPDES-permitted sources.

LA = the Load Allocation, which is the allowable loading of pollutants into the stream from sources not permitted by KPDES and from natural background.

MOS = the Margin of Safety, which can be an implicit or explicit additional reduction applied to sources of pollutants that accounts for uncertainties in the data or TMDL calculations. For this TMDL an explicit MOS of 10% was applied and an implicit MOS was incorporated by calculating WLAs for KPDES-sources at their maximum design capacity.

TMDL Target = the TMDL minus the MOS (or 240 colonies/100 ml - 10% = 216 colonies/100 ml).

#### **Seasonality**

In Kentucky regulations, the PCR use is defined to apply to the period beginning May 1 and ending October 31. For this TMDL, seasonality is considered because samples were collected twice a month to provide data over the entire PCR season.

#### **Critical Condition**

The critical condition for nonpoint source  $\underline{E}$ .  $\underline{\operatorname{coli}}$  (or fecal coliform) loadings is typically an extended dry period followed by a rainfall runoff event. Conversely, the critical condition for point source loading typically occurs during periods of low stream flow when dilution is minimized. Sampling was performed during both types of conditions (during or following rain events and during extended dry periods). The Beaver Creek watershed contains both types of sources; therefore the critical condition for each impaired segment is defined by the sample showing the greatest concentration, which was generally collected during rainfall events.

#### **TMDL Methodology:**

<u>Mean Annual Flows (MAFs)</u>: MAFs were used to convert concentrations of <u>E</u>. <u>coli</u> into loads of <u>E</u>. <u>coli</u>. The MAF for each site was adjusted by either adding or subtracting flow based on any KPDES-permitted dischargers of pathogen indicators or KDOW permitted stream water withdrawals in the watershed upstream of a sample site (yielding the Adjusted MAF for that site).

Existing Loads: For each sample site, the sample with the greatest concentration of  $\underline{E}$ .  $\underline{coli}$  was used as the existing concentration for the site. Existing loads were calculated as:

where the conversion factor converts cfs to ml/day and colonies to billion colonies.

<u>Total TMDL</u>: Total TMDLs were calculated for each site using the <u>E</u>. <u>coli</u> criterion of 240 colonies/100 ml:

MOS: A 10% explicit MOS (i.e., 10% of the WQC, or 24 colonies/100ml,) was set. Additionally, an implicit MOS was incorporated in loading calculations for KPDES-permitted sources by setting their flow at the maximum design capacity. The explicit MOS load for each site was calculated as:

$$\begin{array}{c} 24 \\ \text{(colonies/100ml)} \end{array} \times \begin{array}{c} \text{Adjusted} \\ \times \quad \text{MAF} \\ \text{(cfs)} \end{array} \times \begin{array}{c} \text{Conversion Factor} \\ \text{.0244657584} \end{array} = \begin{array}{c} \text{MOS (billion colonies/day)} \end{array}$$

<u>Target Load</u>: The Target Load was calculated for each site by subtracting the explicit MOS from the Total TMDL (Target Load = Total TMDL – MOS).

<u>Percent Reduction:</u> Percent Reduction (%) = [(Existing Load – Target Load) / Existing Load] \* 100

<u>Calculation of WLAs for Each KPDES-permitted Source:</u> The WLAs are calculated based on the permitted concentration limits expressed in terms of <u>E</u>. <u>coli</u> limits and facility design flow (in units of cfs) using the following equation:

The design capacity in MGD was converted to cfs by multiplying by 1.54723 to convert days to seconds and million gallons to cubic feet.

<u>Calculation of Remainder:</u> The Remainder is not part of the TMDL; however, it is used in the TMDL calculations. It is determined as the Target Load minus the sum of all WLAs for KPDES-permitted sources.

<u>Calculation of Future Growth WLA:</u> Future growth is represented by a portion of the TMDL Target that is set aside (i.e., is not part of the LA nor is it part of the WLA for current/known sources). The Future Growth WLA was calculated as the Remainder multiplied by the appropriate percentage from Table S.2 (Future Growth WLA = Remainder \* Future Growth WLA percentage).

Table S.2 Future Growth WLA Formula

| Percent Developed Area | % of Remainder Set Aside for Future Growth WLA |
|------------------------|--|
| ≥25%                   | 5%   |
| ≥20% – <25%            | 4%   |
| ≥15% -<20%             | 3%   |
| ≥10% -<15%             | 2%   |
| ≥5% −<10%              | 1%   |
| <5%                    | 0.5%   |

<u>Calculation of LA:</u> Load Allocations are calculated as LA= Remainder – Future Growth WLA. The available sampling data were insufficient to apportion the existing loading among the various LA sources; therefore, it is lumped to all LA sources.

#### **TMDLs for Impaired Segments:**

TMDLs and loading allocations are summarized for each segment in Table S.3. All loads are expressed in units of billion  $\underline{E}$ .  $\underline{\operatorname{coli}}$  colonies per day while percent reduction is expressed as a percentage.

#### **Translation of WLAs into Permit Limits:**

All WLAs will be translated into KPDES permit limits as an <u>E</u>. <u>coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average or as a Fecal coliform effluent gross limit of 200 colonies/100 ml as a monthly average and 400 colonies/100 ml as a maximum weekly average.

Table S.3 TMDLs for Impaired Segments

|                       | 3 TMDLs f                 | for Impan            | red Segme        | ents                     |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    |                      |                     |                        |
|-----------------------|---------------------------|----------------------|------------------|--------------------------|-------------------|-------------------|--------------------|---------------------|---------------------|----------------------|---------------------|---------------------|---------------------|--------------------|---------------------|------------------|------------------|--------------------|-----------------------|--------------------|--------------------|----------------------|---------------------|------------------------|
| Loads are in units of |                           |                      |                  |                          |                   |                   |                    |                     |                     |                      |                     | Spewing             | Left Fork           |                    | Right<br>Fork       |                  |                  |                    |                       |                    |                    |                      |                     |                        |
| billion <u>E</u> .    | Percent                   |                      |                  |                          |                   |                   | Left Fork          |                     | Simpson             |                      | Sizemore            | Camp                | Beaver              | Left Fork          | Beaver              | _                |                  | Right Fork         |                       |                    | Right Fork         |                      | Buck                |                        |
| coli<br>colonies/     | Reduction is expressed as |                      | Caleb<br>Fork RM | Clear Creek<br>RM 0.0 to | Jacks<br>Creek RM | Otter<br>Creek RM | Beaver<br>Creek RM | Frasure<br>Creek RM | Branch<br>RM 0.0 to | Spurlock<br>Creek RM | Branch<br>RM 0.0 to | Branch<br>RM 0.0 to | Creek RM<br>11.4 to | Beaver<br>Creek RM | Creek RM<br>30.3 to | Caney<br>Fork RM | Jones<br>Fork RM | Beaver<br>Creek RM | Salt Lick<br>Creek RM | Turkey<br>Creek RM | Beaver<br>Creek RM | Arkansas<br>Creek RM | Branch<br>RM 0.0 to | Beaver<br>Creek 0.0 to |
| day                   | a percentage              |                      | 0.0 to 1.2       | 4.9                      | 0.0 to 4.4        | 0.0 to 0.5        | 18.7 to 28.6       | 0.0 to 5.2          | 1.8                 | 0.0 to 0.6           | 2.0                 | 3.1                 | 13.55               | 0.0 to 11.4        | 33.4                | 0.0 to 7.5       | 0.0 to 9.9       | 17.4 to 23.3       | 0.0 to 6.8            | 0.0 to 5.9         | 0.0 to 17.4        | 0.0 to 3.6           | 2.8                 | 7.1                    |
|                       |                           | Existing<br>Load     | 5284.6038        | 13901.0933               | 1783.7241         | 9686.2876         | 69257.5721         | 27154.7145          | 3436.0145           | 6117.7027            | 3704.6737           | 4327.5145           | 90650.1145          | 126755.5507        | 1994.2419           | 549.4722         | 3243.4191        | 10391.2139         | 27133.8788            | 10107.7083         | 65184.6057         | 8035.3679            | 5798.3369           | 147268.9800            |
|                       |                           | Total<br>TMDL        | 15.8538          | 41.7033                  | 47.5660           | 29.0589           | 207.7727           | 91.7906             | 15.2712             | 29.9643              | 12.3489             | 19.9731             | 315.3047            | 573.9874           | 251.9042            | 191.1208         | 181.0280         | 608.2662           | 98.6687               | 41.1161            | 1203.4081          | 24.1061              | 21.7438             | 1860.2397              |
|                       |                           | MOS                  | 1.5854           | 4.1703                   | 4.7566            | 2.9059            | 20.7773            | 9.1791              | 1.5271              | 2.9964               | 1.2349              | 1.9973              | 31.5305             | 57.3987            | 25.1904             | 19.1121          | 18.1028          | 60.8266            | 9.8669                | 4.1116             | 120.3408           | 2.4106               | 2.1744              | 186.0240               |
|                       |                           | TMDL<br>Target       | 14.2684          | 37.5330                  | 42.8094           | 26.1530           | 186.9954           | 82.6115             | 13.7441             | 26.9678              | 11.1140             | 17.9758             | 283.7743            | 516.5887           | 226.7138            | 172.0087         | 162.9252         | 547.4396           | 88.8018               | 37.0045            | 1083.0673          | 21.6955              | 19.5694             | 1674.2158              |
| AI#                   | KPDES#                    | percent<br>reduction | 99.73            | 99.73                    | 97.60             | 99.73             | 99.73              | 99.70               | 99.60               | 99.56                | 99.70               | 99.58               | 99.69               | 99.59              | 88.63               | 68.70            | 94.98            | 94.73              | 99.67                 | 99.63              | 98.34              | 99.73                | 99.66               | 98.86                  |
| 1133                  | KYG400642                 | KPDES<br>WLA         |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
|                       | KY0085791                 | KPDES<br>WLA         |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.1817             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.1817                 |
|                       | KYG400479                 | KPDES<br>WLA         |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.1817             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                       |                           | KPDES                |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0043             |                     |                  |                  |                    |                       |                    |                    |                      |                     |                        |
| 1158                  | KYG400787                 | WLA<br>KPDES         |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    |                      | 0.0045              | 0.0045                 |
| 1161                  | KYG400692                 | WLA                  |                  |                          |                   |                   |                    |                     |                     | 0.0045               |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 1162                  | KYG400678                 | KPDES<br>WLA         |                  |                          |                   |                   |                    |                     |                     | 0.0045               |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 1168                  | KYG400854                 | KPDES<br>WLA         |                  |                          |                   |                   |                    |                     |                     |                      | 0.0045              |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                       |                           | KPDES                |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    |                      |                     |                        |
| 1168                  | KYG401516                 | WLA<br>KPDES         |                  |                          |                   |                   |                    |                     |                     |                      | 0.0045              |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 1173                  | KYG400790                 | WLA                  |                  | 0.0045                   |                   |                   |                    |                     |                     |                      |                     |                     | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 1180                  | KYG400520                 | KPDES<br>WLA         |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    |                      | 0.0045              | 0.0045                 |
| 1182                  | KYG400614                 | KPDES<br>WLA         |                  |                          |                   |                   |                    | 0.0045              |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                       |                           | KPDES                |                  |                          |                   |                   |                    | 0.0043              |                     |                      |                     |                     |                     | 0.0043             |                     |                  |                  |                    |                       |                    |                    |                      |                     |                        |
| 1196                  | KYG400590                 | WLA<br>KPDES         |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
| 1199                  | KYG400603                 | WLA                  |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    | 0.0045                |                    | 0.0045             |                      |                     | 0.0045                 |
| 1202                  | KYG400969                 | KPDES<br>WLA         |                  |                          |                   |                   |                    | 0.0045              |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 1218                  | KYG400567                 | KPDES<br>WLA         |                  |                          |                   |                   |                    |                     |                     |                      | 0.0045              |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                       | KYG400730                 | KPDES                |                  |                          |                   |                   |                    |                     |                     |                      | 0.0043              |                     |                     | 0.0043             |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
|                       |                           | KPDES                |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0043             |                      |                     |                        |
| 1232                  | KYG400806                 | WLA<br>KPDES         |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    |                      | 0.0045              | 0.0045                 |
| 1237                  | KYG400753                 | WLA                  |                  | 0.0045                   |                   |                   |                    |                     |                     |                      |                     |                     | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 1243                  | KYG400915                 | KPDES<br>WLA         |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  | 0.0045             |                       |                    | 0.0045             |                      |                     | 0.0045                 |
| 1248                  | KYG400593                 | KPDES<br>WLA         |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    | 0.0045               |                     | 0.0045                 |
|                       |                           | KPDES                |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    | 0.0043               |                     |                        |
| 1255                  | KY0096342                 | WLA<br>KPDES         |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.1635             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.1635                 |
| 1262                  | KY0026921                 | WLA                  |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    |                      |                     | 1.0902                 |
| 1263                  | KY0103136                 |                      |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 1265                  | KYG400612                 | KPDES<br>WLA         |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                       | KYG400970                 | KPDES                |                  | 0.0045                   |                   |                   |                    |                     |                     |                      |                     |                     | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                       | KYG400478                 | KPDES                |                  | 0.0010                   |                   |                   |                    | 0.0045              |                     |                      |                     |                     | 0.0010              | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 1209                  | 111 0 100 1/0             | W Lit                |                  |                          |                   |                   |                    | 0.0073              |                     |                      |                     |                     |                     | 0.0073             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0073                 |

|                                |                           |              |                  |                          |                   |                   |                    |                     |                     |                      |                     | a :                 | Y 0 D 1             |                    | Right<br>Fork       |                  |                  |                    |                       |                    |                    |                      |                     |                        |
|--------------------------------|---------------------------|--------------|------------------|--------------------------|-------------------|-------------------|--------------------|---------------------|---------------------|----------------------|---------------------|---------------------|---------------------|--------------------|---------------------|------------------|------------------|--------------------|-----------------------|--------------------|--------------------|----------------------|---------------------|------------------------|
| in units of billion <u>E</u> . | Percent                   |              |                  |                          |                   |                   | Left Fork          |                     | Simpson             |                      | Sizemore            | Spewing<br>Camp     | Left Fork<br>Beaver | Left Fork          | Beaver              |                  |                  | Right Fork         |                       |                    | Right Fork         |                      | Buck                |                        |
| coli R colonies/ e             | Reduction is expressed as |              | Caleb<br>Fork RM | Clear Creek<br>RM 0.0 to | Jacks<br>Creek RM | Otter<br>Creek RM | Beaver<br>Creek RM | Frasure<br>Creek RM | Branch<br>RM 0.0 to | Spurlock<br>Creek RM | Branch<br>RM 0.0 to | Branch<br>RM 0.0 to | Creek RM<br>11.4 to | Beaver<br>Creek RM | Creek RM<br>30.3 to | Caney<br>Fork RM | Jones<br>Fork RM | Beaver<br>Creek RM | Salt Lick<br>Creek RM | Turkey<br>Creek RM | Beaver<br>Creek RM | Arkansas<br>Creek RM | Branch<br>RM 0.0 to | Beaver<br>Creek 0.0 to |
|                                | a percentage              |              | 0.0 to 1.2       | 4.9                      | 0.0 to 4.4        | 0.0 to 0.5        | 18.7 to 28.6       | 0.0 to 5.2          | 1.8                 | 0.0 to 0.6           | 2.0                 | 3.1                 | 13.55               | 0.0 to 11.4        | 33.4                | 0.0 to 7.5       |                  | 17.4 to 23.3       | 0.0 to 6.8            | 0.0 to 5.9         | 0.0 to 17.4        | 0.0 to 3.6           | 2.8                 | 7.1                    |
| 1270 K                         | KYG400666                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
| 1274 F                         |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 1276 k                         | KYG400975                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       | 0.0045             | 0.0045             |                      |                     | 0.0045                 |
|                                |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  | 0.0045             |                       |                    | 0.0045             |                      |                     | 0.0045                 |
|                                |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    | 0.0045               |                     | 0.0045                 |
|                                |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0899             |                     |                  |                  |                    |                       |                    |                    | 0.0012               |                     | 0.0899                 |
|                                |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0077             |                     |                  |                  |                    | 0.0045                |                    | 0.0045             |                      |                     | 0.0045                 |
|                                |                           | KPDES        |                  |                          |                   |                   |                    |                     |                     | 0.0045               |                     |                     |                     | 0.0045             |                     |                  |                  |                    | 0.0045                |                    | 0.0045             |                      |                     |                        |
|                                |                           | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     | 0.0045               |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                                |                           | WLA<br>KPDES |                  |                          |                   |                   |                    | 0.0045              |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                                |                           | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    | 0.0045               |                     | 0.0045                 |
| 1343 K                         |                           | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
| 1352 K                         | KY0072974                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.2271             |                      |                     | 0.2271                 |
| 1367 K                         | KYG400579                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 1369 K                         | KYG400724                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      | 0.0045              |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 2514 K                         |                           | WLA          |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  | 0.0273           |                    |                       |                    | 0.0273             |                      |                     | 0.0273                 |
| 2517 K                         | KY0083089                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  | 0.0908           |                    |                       |                    | 0.0908             |                      |                     | 0.0908                 |
| 2527 K                         |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     | 0.9085           |                  | 0.9085             |                       |                    | 0.9085             |                      |                     | 0.9085                 |
| 4250 F                         |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 4327 k                         |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
| 4331 F                         | KYG401143                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    | 0.0045               |                     | 0.0045                 |
|                                |                           | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                                |                           | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                                |                           | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     | 0.0043              | 0.0043             |                     |                  |                  | 0.0045             |                       |                    | 0.0045             |                      |                     |                        |
|                                |                           | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  | 0.0045             |                       |                    | 0.0045             | 0.0045               |                     | 0.0045                 |
|                                | KYG401126                 | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    | 0.0045               |                     | 0.0045                 |
|                                | KYG401121                 | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       | 0.0045             | 0.0045             |                      |                     | 0.0045                 |
|                                | KYG401133                 | KPDES        |                  |                          | 0.0045            |                   | 0.0045             |                     |                     |                      |                     |                     | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 4350 K                         | KYG401113                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    | 0.0045                |                    | 0.0045             |                      |                     | 0.0045                 |
| 4356 K                         | KYG401040                 |              |                  |                          |                   |                   |                    | 0.0045              |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 4405 K                         | KYG401197                 | WLA          |                  |                          |                   |                   |                    |                     |                     |                      |                     | 0.0045              | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 12253 K                        | KYG401218                 |              |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
| 15635 F                        | KYG401271                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |

| Loads are                      |                           |              |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    | Right<br>Fork       |                  |                  |                    |                       |                    |                    |                      |                     |                        |
|--------------------------------|---------------------------|--------------|------------------|--------------------------|-------------------|-------------------|--------------------|---------------------|---------------------|----------------------|---------------------|---------------------|---------------------|--------------------|---------------------|------------------|------------------|--------------------|-----------------------|--------------------|--------------------|----------------------|---------------------|------------------------|
| in units of billion <u>E</u> . | Percent                   |              |                  |                          |                   |                   | Left Fork          |                     | Simpson             |                      | Sizemore            | Spewing<br>Camp     | Left Fork<br>Beaver | Left Fork          | Fork<br>Beaver      |                  |                  | Right Fork         |                       |                    | Right Fork         |                      | Buck                |                        |
| coli<br>colonies/              | Reduction is expressed as |              | Caleb<br>Fork RM | Clear Creek<br>RM 0.0 to | Jacks<br>Creek RM | Otter<br>Creek RM | Beaver<br>Creek RM | Frasure<br>Creek RM | Branch<br>RM 0.0 to | Spurlock<br>Creek RM | Branch<br>RM 0.0 to | Branch<br>RM 0.0 to | Creek RM<br>11.4 to | Beaver<br>Creek RM | Creek RM<br>30.3 to | Caney<br>Fork RM | Jones<br>Fork RM | Beaver<br>Creek RM | Salt Lick<br>Creek RM | Turkey<br>Creek RM | Beaver<br>Creek RM | Arkansas<br>Creek RM | Branch<br>RM 0.0 to | Beaver<br>Creek 0.0 to |
| day                            | a percentage              |              | 0.0 to 1.2       | 4.9                      | 0.0 to 4.4        | 0.0 to 0.5        |                    | 0.0 to 5.2          | 1.8                 | 0.0 to 0.6           | 2.0                 | 3.1                 | 13.55               | 0.0 to 11.4        | 33.4                | 0.0 to 7.5       | 0.0 to 9.9       | 17.4 to 23.3       | 0.0 to 6.8            | 0.0 to 5.9         | 0.0 to 17.4        | 0.0 to 3.6           | 2.8                 | 7.1                    |
| 15655                          | KYG401296                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
| 15807                          | KYG401352                 |              |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
| 33378                          | KYG401353                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
|                                |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    | 0.0636              |                  |                  | 0.0636             |                       |                    |                    |                      |                     | 0.0636                 |
|                                |                           | KPDES<br>WLA |                  |                          |                   |                   | 0.0618             |                     |                     |                      |                     |                     | 0.0618              | 0.0618             |                     |                  |                  | 00000              |                       |                    |                    |                      |                     | 0.0618                 |
|                                |                           | KPDES<br>WLA |                  |                          |                   |                   | 0.0010             | 0.1363              |                     |                      |                     |                     | 0.0010              | 0.1363             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.1363                 |
|                                |                           | KPDES<br>WLA |                  |                          |                   |                   |                    | 0.1303              |                     |                      |                     |                     |                     | 0.1303             |                     |                  |                  |                    |                       |                    | 0.0999             |                      |                     | 0.0999                 |
|                                |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0999             |                      |                     | 0.0727                 |
|                                |                           | KPDES        |                  |                          |                   |                   | 0.1272             |                     |                     |                      |                     |                     | 0.1262              | 0.12/2             |                     |                  |                  |                    |                       |                    | 0.0727             |                      |                     |                        |
|                                |                           | WLA<br>KPDES |                  |                          |                   |                   | 0.1363             |                     |                     |                      |                     |                     | 0.1363              | 0.1363             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.1363                 |
| 35260                          |                           | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.2271             |                      |                     | 0.2271                 |
| 35359                          |                           | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  | 0.0545           |                    |                       |                    | 0.0545             |                      |                     | 0.0545                 |
| 35761                          | KY0105228                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  | 0.9085             |                       |                    | 0.9085             |                      |                     | 0.9085                 |
| 35887                          | KYG401533                 | WLA<br>KPDES |                  |                          |                   |                   |                    | 0.0045              |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 35892                          | KYG401529                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 36057                          | KYG401541                 | WLA          |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 40534                          | KY0028789                 | KPDES<br>WLA |                  |                          |                   | 2.0441            | 2.0441             |                     |                     |                      |                     |                     | 2.0441              | 2.0441             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 2.0441                 |
| 43120                          | KYG401540                 |              |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
| 43224                          | KYG401548                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
| 44695                          | KYG401580                 | KPDES<br>WLA |                  |                          |                   | 0.0045            | 0.0045             |                     |                     |                      |                     |                     | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 45070                          | KYG401590                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 45073                          | KYG401582                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                                | KYG401587                 | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                                | KYG401601                 | KPDES        |                  |                          |                   |                   |                    |                     |                     | 0.0045               |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                                | KYG401603                 | KPDES        |                  |                          |                   |                   |                    |                     |                     | 0.0010               |                     |                     |                     | 0.0018             |                     |                  | 0.0045           |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
|                                |                           | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  | 0.0043           |                    |                       |                    |                    |                      |                     |                        |
|                                | KYG401638                 | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.004=             |                     |                  |                  |                    |                       |                    | 0.0045             |                      |                     | 0.0045                 |
|                                | KYG401645                 | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                                | KYG401646                 | KPDES        |                  |                          |                   |                   | 0.0045             |                     |                     |                      |                     |                     | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
|                                | KYG401654                 | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     | 0.0045              | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 50021                          | KYG401692                 | WLA<br>KPDES |                  |                          |                   |                   |                    | 0.0045              |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 50138                          | KYG401699                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |                    |                      |                     | 0.0045                 |
| 50627                          | KYG401721                 |              |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       | 0.0045             | 0.0045             |                      |                     | 0.0045                 |

Final

Beaver Creek Watershed E. coli TMDL

September, 2010

| Y 1                   | 1            | Ī                            |            |             |            |            |              |            |           |            |           |           |           |             | D: 1.         |            |            |              |            |            |             |            |           |              |
|-----------------------|--------------|------------------------------|------------|-------------|------------|------------|--------------|------------|-----------|------------|-----------|-----------|-----------|-------------|---------------|------------|------------|--------------|------------|------------|-------------|------------|-----------|--------------|
| Loads are in units of |              |                              |            |             |            |            |              |            |           |            |           | Spewing   | Left Fork |             | Right<br>Fork |            |            |              |            |            |             |            |           |              |
| billion <u>E</u> .    | Percent      |                              |            |             |            |            | Left Fork    |            | Simpson   |            | Sizemore  | Camp      | Beaver    | Left Fork   | Beaver        |            |            | Right Fork   |            |            | Right Fork  |            | Buck      |              |
| coli                  | Reduction is |                              | Caleb      | Clear Creek | Jacks      | Otter      | Beaver       | Frasure    | Branch    | Spurlock   | Branch    | Branch    | Creek RM  | Beaver      | Creek RM      | Caney      | Jones      | Beaver       | Salt Lick  | Turkey     | Beaver      | Arkansas   | Branch    | Beaver       |
| colonies/             | expressed as |                              | Fork RM    | RM 0.0 to   | Creek RM   | Creek RM   | Creek RM     | Creek RM   | RM 0.0 to | Creek RM   | RM 0.0 to | RM 0.0 to | 11.4 to   | Creek RM    | 30.3 to       | Fork RM    | Fork RM    | Creek RM     | Creek RM   | Creek RM   | Creek RM    | Creek RM   | RM 0.0 to | Creek 0.0 to |
| day                   | a percentage |                              | 0.0 to 1.2 | 4.9         | 0.0 to 4.4 | 0.0 to 0.5 | 18.7 to 28.6 | 0.0 to 5.2 | 1.8       | 0.0 to 0.6 | 2.0       | 3.1       | 13.55     | 0.0 to 11.4 | 33.4          | 0.0 to 7.5 | 0.0 to 9.9 | 17.4 to 23.3 | 0.0 to 6.8 | 0.0 to 5.9 | 0.0 to 17.4 | 0.0 to 3.6 | 2.8       | 7.1          |
| 50950                 | KYG401730    | KPDES<br>WLA                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              | 0.0045     |            | 0.0045      |            |           | 0.0045       |
| 53921                 | KYG401764    | KPDES<br>WLA                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            |             | 0.0045     |           | 0.0045       |
| 54879                 | KYG401772    | KPDES<br>WLA                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            | 0.0045      |            |           | 0.0045       |
| 71436                 | KYG401809    | KPDES<br>WLA                 |            |             |            |            |              | 0.0045     |           |            |           |           |           | 0.0045      |               |            |            |              |            |            |             |            |           | 0.0045       |
|                       |              | KPDES<br>WLA                 |            |             |            |            |              | 000000     | 0.0045    |            |           |           |           | 0.0045      |               |            |            |              |            |            |             |            |           | 0.0045       |
|                       |              | KPDES                        |            |             |            |            |              |            | 0.0043    |            |           |           |           | 0.0045      |               |            |            |              |            |            |             |            |           | 0.0045       |
| 74025                 |              | WLA<br>KPDES                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            |             |            |           |              |
| 74062                 | KYG401442    | WLA<br>KPDES                 |            |             |            |            |              |            |           |            |           |           | 0.0045    | 0.0045      |               |            |            |              |            |            |             |            |           | 0.0045       |
| 74181                 | KYG401470    | WLA<br>KPDES                 |            |             |            |            | 0.0045       |            |           |            |           |           | 0.0045    | 0.0045      |               |            |            |              |            |            |             |            |           | 0.0045       |
| 74185                 | KYG401475    | WLA<br>KPDES                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              | 0.0045     |            | 0.0045      |            |           | 0.0045       |
| 74243                 | KYG401821    | WLA                          |            |             |            |            |              | 0.0045     |           |            |           |           |           | 0.0045      |               |            |            |              |            |            |             |            |           | 0.0045       |
| 75141                 | KYG401851    | KPDES<br>WLA                 |            |             |            |            |              |            |           |            |           |           |           | 0.0045      |               |            |            |              |            |            |             |            |           | 0.0045       |
| 75556                 | KYG401857    | KPDES<br>WLA                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            | 0.0045      |            |           | 0.0045       |
|                       | KYG401868    | KPDES<br>WLA                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            |             |            | 0.0045    | 0.0045       |
|                       | KYG401876    | KPDES<br>WLA                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            | 0.0045      |            | 0.0012    | 0.0045       |
|                       |              | KPDES                        |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            | 0.0045      |            |           |              |
|                       |              | WLA<br>KPDES                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            |             | 0.0045     |           | 0.0045       |
| 79525                 | KYG401931    | WLA<br>KPDES                 |            |             |            |            |              | 0.0045     |           |            |           |           |           | 0.0045      |               |            |            |              |            |            |             |            |           | 0.0045       |
| 79842                 | KYG401936    | WLA<br>KPDES                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            |             |            |           | 0.0045       |
| 81193                 | KYG401970    | WLA<br>KPDES                 |            |             |            |            |              | 0.0045     |           |            |           |           |           | 0.0045      |               |            |            |              |            |            |             |            |           | 0.0045       |
| 81570                 | KYG401981    | WLA                          |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            | 0.0045      |            |           | 0.0045       |
| 82092                 | KY0106755    | KPDES<br>WLA                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            | 0.0545      |            |           | 0.0545       |
| 82471                 | KYG402002    |                              |            |             |            |            |              |            |           |            |           |           |           | 0.0045      |               |            |            |              |            |            |             |            |           | 0.0045       |
| 84292                 | KYG402025    |                              |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            | 0.0045      |            |           | 0.0045       |
| 97291                 | KYG402063    | KPDES<br>WLA                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            | 0.0045      |            |           | 0.0045       |
|                       | KYG402117    | KPDES                        |            |             |            |            |              | 0.0045     |           |            |           |           |           | 0.0045      |               |            |            |              |            |            |             |            |           | 0.0045       |
|                       |              | KPDES                        |            |             |            |            |              | 0.0043     |           |            |           |           |           | 0.0013      |               |            |            |              |            |            |             |            |           |              |
| 129/                  | KY0027413    | WLA<br>Total                 |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            |             |            |           | 0.0000       |
|                       |              | KPDES<br>WLA                 | 0.000      | 0.0135      | 0.0045     | 2.0486     | 2.2602       | 0.1903     | 0.0045    | 0.018      | 0.018     | 0.009     | 2.2962    | 3.0206      | 0.0636        | 0.9085     | 0.1771     | 1.8941       | 0.0225     | 0.0135     | 2.8104      | 0.0315     | 0.018     | 7.060855     |
|                       |              | remainder                    | 14.2684    | 37.5193     | 42.8048    | 24.1043    | 184.7351     | 82.4207    | 13.7395   | 26.9497    | 11.0959   | 17.9667   | 281.4776  | 513.5661    | 226.6502      | 171.1002   | 162.7481   | 545.5453     | 88.7791    | 36.9909    | 1080.2555   | 21.6637    | 19.5512   | 1667.1549    |
|                       |              | Future                       |            |             |            |            |              |            |           |            |           |           |           |             |               |            |            |              |            |            |             |            |           |              |
|                       |              | Growth<br>WLA <sup>(1)</sup> | 0.0713     | 0.3752      | 0.4280     | 0.2410     | 1.8474       | 0.8242     | 0.0687    | 0.2695     | 0.1110    | 0.0898    | 2.8148    | 5.1357      | 2.2665        | 0.8555     | 0.8137     | 5.4555       | 0.8878     | 0.1850     | 10.8026     | 0.2166     | 0.1955    | 16.6715      |
|                       |              | Total                        |            | 0,0702      | 0.1200     |            |              |            | 0.0007    | VIEU75     | VIIIU     |           |           |             |               |            | 0,0107     |              |            |            |             |            | 0.1700    |              |
|                       |              | WLA                          | 0.07134    | 0.3887      | 0.4325     | 2.2896     | 4.1076       | 1.0145     | 0.0732    | 0.2875     | 0.129     | 0.0988    | 5.111     | 8.1563      | 2.3301        | 1.764      | 0.9908     | 7.3496       | 0.9103     | 0.1985     | 13.613      | 0.2481     | 0.2135    | 23.7324      |
| Notes                 |              | LA                           | 14.1971    | 37.1441     | 42.3768    | 23.8633    | 182.8877     | 81.5965    | 13.6708   | 26.6802    | 10.9849   | 17.8769   | 278.6628  | 508.4304    | 224.3837      | 170.2447   | 161.9343   | 540.0899     | 87.8913    | 36.8059    | 1069.4529   | 21.4471    | 19.3557   | 1650.4834    |

Note:

(1) Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

#### 1.0 Introduction

#### 1.1 Section 303(d) Requirements

Section 303(d) of the Clean Water Act (1972) requires states to identify waters within their boundaries that have been assessed and are not currently meeting their designated uses (per 401 KAR 10:026 and 10:031) and that require a Total Maximum Daily Load (TMDL). States must establish a priority ranking for such waters, taking into account their intended uses and the severity of the pollutant. Section 303(d) also requires that states provide a list of this information called the 303(d) list. This list is submitted to the Environmental Protection Agency (EPA) during even numbers years and each submittal replaces the previous list. The 2008-303(d) information for Kentucky can be found in the 2008 Integrated Report to Congress on the Condition of Water Resources in Kentucky Volume II. 303(d) List of Surface Waters (Kentucky Division of Water [KDOW], 2008a) and can be obtained at: <a href="http://water.ky.gov">http://water.ky.gov</a>.

States are required to develop TMDLs for the listed pollutants that cause a waterbody to fail to meet its designated uses. The TMDL process establishes the allowable amount (i.e. "load") of pollutant a waterbody can naturally assimilate while continuing to meet the water quality criteria (WQC) for each designated use. The pollutant load must be established at a level necessary to implement the applicable WQC with seasonal variations and a margin of safety (MOS) which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. This total load is then divided among different sources of the pollutant in a watershed. Information from EPA on TMDLs can be found at: <a href="http://www.epa.gov/owow/tmdl">http://www.epa.gov/owow/tmdl</a>.

#### **1.2 TMDL Definitions**

A Total Maximum Daily Load (TMDL) = Waste Load Allocation (WLA) + Load Allocation (LA) + Margin of Safety (MOS), where:

TMDL = the maximum amount of a pollutant that a waterbody can receive over a one day period and not be impaired for its designated use(s). This amount must be determined as a load (mass/day or colonies/day).

WLA = the part of the TMDL that is portioned among sources that are regulated under the Kentucky Pollutant Discharge Elimination System (KPDES) program in KY. These sources are often referred to as point sources because they frequently, but not always, discharge through a pipe directly to a waterbody. These sources require a KPDES permit that places limits on the amount of pollutant that can be legally discharged to a waterbody. For this document, the WLA has two components, the KPDES-permitted WLA (for sources mentioned above) and a Future Growth WLA (a portion of the loading reserved for expanding and new KPDES-permitted sources).

LA = the part of the TMDL that is portioned among sources that do not require a KPDES-permit. These sources are often referred to as nonpoint sources because they tend to discharge to a

waterbody following periods of rain or snow melt that wash the pollutant into the waterbody. Natural background levels of a pollutant are also included in this category.

MOS = an implicit (using conservative assumptions) or explicit (a reserved portion) additional reduction applied to the WLA, LA or both types of sources that accounts for uncertainties in the data or TMDL calculations.

#### 1.3 Beaver Creek Watershed

Beaver Creek and Right Fork Beaver Creek were 303(d) listed on the 2008 Integrated Report for the Primary Contact Recreation (PCR) use due to fecal coliform (a pathogen indicator) (KDOW, 2008a). The Beaver Creek Watershed is located in the Big Sandy River Basin in Floyd and Knott Counties and encompasses the cities of Wheelwright and Pippa Passes in its headwaters, Wayland in its midst, and Martin and Allen near its confluence with Levisa Fork. A map depicting the location of the Beaver Creek Watershed is shown in Figure 1.1.

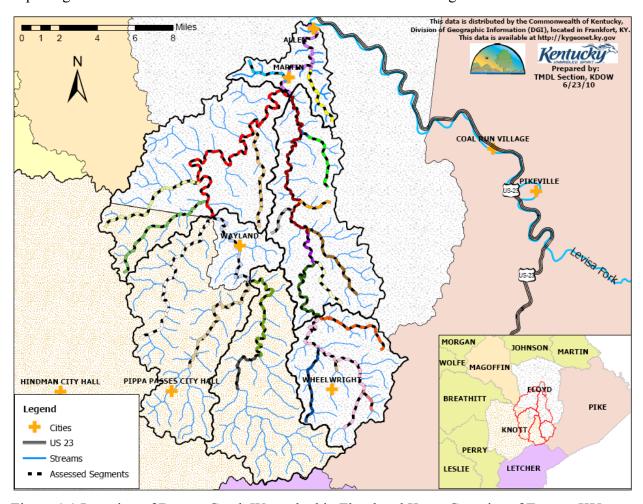


Figure 1.1 Location of Beaver Creek Watershed in Floyd and Knott Counties of Eastern KY

KDOW contracted with Eastern Kentucky University (EKU) to monitor for <u>Escherichia coli</u> (<u>E. coli</u>, another pathogen indicator) in the Beaver Creek watershed, including the Right Fork and Left Fork of Beaver Creek and their major tributaries. This sampling was performed by the students and staff of the Eastern Kentucky Environmental Research Institute at EKU under the direction of Dr. Alice Jones and Environmental Specialist Reagan Butcher. This document contains the monitoring results and describes TMDL development for pathogen indicators in the Beaver Creek watershed as required under Section 303(d) of the Clean Water Act.

#### 2.0 Problem Definition

The Clean Water Act requires states to designate uses for surface waters within their jurisdiction. The designated uses assigned to waterbodies in Kentucky can be found in 401 KAR 10:026 and includes primary contact recreation (PCR) and secondary contact recreation (SCR). 401 KAR 10:001 defines PCR waters as those "waters suitable for full body contact recreation during the recreation season of May 1 through October 31" and SCR waters as "waters suitable for partial body contact recreation, with minimal threat to public health due to water quality." 401 KAR 10:031 establishes standards that are "minimum requirements that apply to all surface waters in the Commonwealth of Kentucky in order to maintain and protect them for designated uses." The pathogen-related Water Quality Criteria (WQC) in 401 KAR 10:031 are based upon those proposed by EPA in 1986 (EPA, 1986) and, at the levels established, would cause an estimated occurrence of illness in 8 out of 1000 swimmers in fresh waters.

The term pathogen refers to bacteria, viruses, or other biological agents (like parasites) that can cause disease. Because it is currently resource intensive, difficult, and a potential health hazard to detect most pathogens in water, other organisms are used to indicate whether the presence of pathogens is likely in waters. Like EPA's proposed criteria, Kentucky uses fecal coliform bacteria and Escherichia coli (E. coli) bacteria as indicator organisms of pathogens. Fecal coliform and E. coli are found in the fecal waste of humans and warm-blooded animals (birds and mammals). The presence of these bacteria in a waterbody indicates that contamination from human or animal wastes has occurred and that pathogens may be present. Per 401 KAR 10:031:

"The following criteria shall apply to waters designated as primary contact recreation use during the primary contact recreation season of May 1 through October 31: Fecal coliform content or <u>Escherichia coli</u> content shall not exceed 200 colonies per 100 ml or 130 colonies per 100 ml respectively as a geometric mean based on not less than five (5) samples taken during a thirty (30) day period. Content also shall not exceed 400 colonies per 100 ml in twenty (20) percent or more of all samples taken during a thirty (30) day period for fecal coliform or 240 colonies per 100 ml for <u>Escherichia coli</u>."

#### Additionally,

"The following criteria shall apply to waters designated for secondary contact recreation use during the entire year: Fecal coliform content shall not exceed 1000 colonies per 100 ml as a thirty (30) day geometric mean based on not less than five (5) samples; nor exceed 2000 colonies per 100 ml in twenty (20) percent or more of all samples taken during a thirty (30) day period."

EPA and the Council of State Territorial Epidemiologist maintain a Waterbourne Disease and Outbreak Surveillance System to report water-related disease outbreaks. Their reports can be obtained at <a href="http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5709a1.htm">http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5709a1.htm</a>. The latest report from 2008 provides information on waterborne disease outbreaks across the United States during 2005 and 2006. During this period, 13 outbreaks of gastroenteritis from swimming in lakes or rivers were reported, along with five fatal cases of Primary Amebic Meningoencephalitis (caused by an ameba; <a href="Naegleria fowleri">Naegleria fowleri</a>), two outbreaks of Leptospirosis (affecting 46 people), and two outbreaks of cercarial dermatitis (caused by avian schistosomes) (Yoder, et. al. 2008). The

number of unreported cases of waterborne diseases contacted by people recreating in and around natural freshwaters is unknown.

Beaver Creek from river miles (RM) 0.0 to 7.1 was first listed as impaired for pathogens on the 2004-303(d) list (KDOW, 2005a). This initial listing was carried forward to the 2006 303(d) list when the Right Fork of Beaver Creek from RM 0.0 to 17.4 was also listed as impaired for pathogens (KDOW, 2007). During the 2008 listing cycle, these pathogen listings were more correctly identified with the indicator organism used; in this case fecal coliform (KDOW, 2008a). KDOW contracted with Eastern Kentucky University to collect Escherichia coli data in the Beaver Creek Watershed during the 2007 and 2008 PCR seasons. The assessment results from this monitoring effort indicated that many additional stream segments within the watershed were impaired for the PCR use. On the draft 2010 list, these additional segments are proposed for listing for E. coli, which will result in the 22 listings shown in Table 2.1 (KDOW, 2010a). KDOW designates a waterbody as partial support for PCR if 20 to 33% of samples collected exceed these criteria. In addition to the segments found to be impaired, four segments were found to be fully supporting for the pathogen PCR use as shown in Table 2.2.

Table 2.1 Proposed 2010 303(d) Listings for Pathogen Indicators in the Beaver Creek Watershed

| Waterbody & Segment | County | Support<br>Status | Use   | Pollutant          | Suspected Source(s)                              |
|---------------------|--------|-------------------|-------|--------------------|--|
| Arkansas            |        |                   |       |                    | `          |
| Creek 0.0 to        |        |                   |       | Escherichia        | On-Site Treatment Systems (Septic Systems and    |
| 3.6                 | Floyd  | Nonsupport        | PCR   | coli               | Similar Decentralized Systems)                   |
|                     |        | • •               |       |                    | Municipal (Urbanized High Density Area), On-     |
|                     |        |                   |       |                    | Site Treatment Systems (Septic Systems and       |
|                     |        |                   |       |                    | Similar Decentralized Systems), Package Plant or |
| Beaver Creek        |        |                   |       | <u>Escherichia</u> | Other Permitted Small Flows Discharges,          |
| 0.0 to 7.1          | Floyd  | Nonsupport        | PCR   | <u>coli</u>        | Unspecified Domestic Waste                       |
| Buck Branch         |        |                   |       | <u>Escherichia</u> | On-Site Treatment Systems (Septic Systems and    |
| 0.0 to 2.8          | Floyd  | Nonsupport        | PCR   | <u>coli</u>        | Similar Decentralized Systems)                   |
| Caleb Fork          |        |                   |       | Escherichia        | On-Site Treatment Systems (Septic Systems and    |
| 0.0 to 1.2          | Floyd  | Nonsupport        | PCR   | <u>coli</u>        | Similar Decentralized Systems)                   |
| Caney Fork          |        |                   |       | <u>Escherichia</u> | Package Plant or Other Permitted Small Flows     |
| 0.0 to 7.5          | Knott  | Nonsupport        | PCR   | <u>coli</u>        | Discharges                                       |
| Clear Creek         |        |                   |       | Escherichia        | On-Site Treatment Systems (Septic Systems and    |
| 0.0 to 4.9          | Floyd  | Nonsupport        | PCR   | coli               | Similar Decentralized Systems)                   |
|                     |        |                   |       |                    | On-Site Treatment Systems (Septic Systems and    |
| Frasure Creek       |        |                   |       | Escherichia        | Similar Decentralized Systems), Package Plant or |
| 0.0 to 5.2          | Floyd  | Nonsupport        | PCR   | coli               | Other Permitted Small Flows Discharges           |
| Jacks Creek         |        |                   |       | Escherichia        | On-Site Treatment Systems (Septic Systems and    |
| 0.0 to 4.4          | Floyd  | Nonsupport        | PCR   | coli               | Similar Decentralized Systems)                   |
| Jones Fork          |        | 11                |       | Escherichia        | On-Site Treatment Systems (Septic Systems and    |
| 0.0 to 9.9          | Knott  | Nonsupport        | PCR   | coli               | Similar Decentralized Systems)                   |
| Left Fork           | THIOU  | 1.onsupport       | 2 010 | 2311               | On-Site Treatment Systems (Septic Systems and    |
| Beaver Creek        |        |                   |       | Escherichia        | Similar Decentralized Systems), Package Plant or |
| 0.0 to 11.4         | Floyd  | Nonsupport        | PCR   | coli               | Other Permitted Small Flows Discharges           |

| Waterbody &                                |        | Support            |             |   |   |  |  |  |  |
|--|--------|--------------------|-------------|---|---|--|--|--|--|
| Segment                                    | County | Status             | Use         | Pollutant   | Suspected Source(s)   |  |  |  |  |
| Left Fork<br>Beaver Creek<br>11.4 to 13.55 | Floyd  | Nonsupport         | PCR         | Escherichia coli  | On-Site Treatment Systems (Septic Systems and<br>Similar Decentralized Systems), Package Plant or<br>Other Permitted Small Flows Discharges |  |  |  |  |
| Left Fork<br>Beaver Creek<br>18.7 to 28.6  | Floyd  | Nonsupport         | PCR         | Escherichia coli  | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |  |  |  |  |
| Otter Creek<br>0.0 to 0.5                  | Floyd  | Nonsupport         | PCR         | Escherichia<br>coli   | Package Plant or Other Permitted Small Flows Discharges   |  |  |  |  |
| Right Fork<br>Beaver Creek<br>0.0 to 17.4  | Floyd  | Nonsupport         | PCR,<br>SCR | Escherichia<br>coli, Fecal<br>coliform  | Inappropriate Waste Disposal  |  |  |  |  |
| Right Fork<br>Beaver Creek<br>17.4 to 23.3 | Floyd  | Nonsupport         | PCR         | On-Site Treatment Systems (Septic Systems and<br>Similar Decentralized Systems), Package Plant or<br>Other Permitted Small Flows Discharges |   |  |  |  |  |
| Right Fork<br>Beaver Creek<br>30.3 to 33.4 | Knott  | Nonsupport         | PCR         | On-Site Treatment Systems (Septic Systems and<br>Similar Decentralized Systems), Package Plant or<br>Other Permitted Small Flows Discharges |   |  |  |  |  |
| Salt Lick<br>Creek 0.0 to<br>6.8           | Floyd  | Nonsupport         | PCR         | Escherichia coli  | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |  |  |  |  |
| Simpson<br>Branch 0.0 to<br>1.8            | Floyd  | Nonsupport         | PCR         | Escherichia coli  | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |  |  |  |  |
| Sizemore<br>Branch 0.0 to<br>2.0           | Floyd  | Nonsupport         | PCR         | Escherichia coli  | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |  |  |  |  |
| Spewing<br>Camp Branch<br>0.0 to 3.1       | Floyd  | Partial<br>Support | PCR         | Escherichia coli  | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |  |  |  |  |
| Spurlock<br>Creek 0.0 to<br>0.6            | Floyd  | Nonsupport         | PCR         | Escherichia coli  | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |  |  |  |  |
| Turkey Creek 0.0 to 5.9                    | Floyd  | Nonsupport         | PCR         | Escherichia coli  | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |  |  |  |  |

Table 2.2 Proposed PCR-Use Fully Supporting Segments in the Beaver Creek Watershed

| Waterbody & Segment                  | County | Support Status | Use |
|--------------------------------------|--------|----------------|-----|
| Spurlock 0.6 to 4.0                  | Floyd  | Full Support   | PCR |
| Left Fork Beaver Creek 13.55 to 18.7 | Floyd  | Full Support   | PCR |
| Rock Fork 0.0 to 7.0                 | Floyd  | Full Support   | PCR |
| Right Fork Beaver Creek 23.3 to 30.3 | Knott  | Full Support   | PCR |

#### 3.0 Physical Setting

#### 3.1 Location

Beaver Creek is located Floyd (population 42,441) and Knott (population 17,649) Counties, west of Pikeville and US 23, and encompasses the cities of Wheelwright (population 1,042) and Pippa Passes (population 297) in its headwaters, Wayland (population 298) in its midst, and Martin (population 633) and Allen (population 150) near its confluence with Levisa Fork (U.S. Census Bureau 2007). Figure 1.1 showed the location of the Beaver Creek Watershed. The Beaver Creek watershed is in the Big Sandy River Basin, United States Geological Survey (USGS) 6-digit hydrologic unit code (HUC) # 050702. The system of HUCs was developed by the USGS to identify specific watersheds (all the land area that drains to a particular stream) (USGS, 2004). The larger the HUC number, the smaller the watershed and the more specific the identification of a watershed to one particular stream.

The Beaver Creek Watershed is in the Eastern Kentucky physiographic region, in the Level III Ecoregion of the Central Appalachians (Figure 3.1). Information from Woods, et. al. (2002) indicates that this Ecoregion is dominated by forested hills with narrow ridges and narrow valleys. Streams in this area have moderate to high gradients with cobble or boulder substrates. Surface and underground bituminous coal mines, logging, and oil and gas production are common in this Ecoregion, while agriculture is limited due to the rugged terrain and nutrient poor soils. The Beaver Creek watershed is approximately 240 square miles in area.

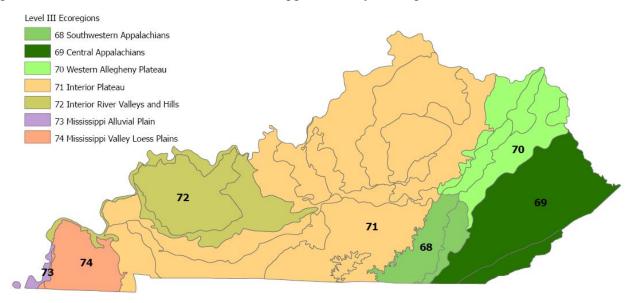


Figure 3.1 Level III Ecoregions in Kentucky after Woods et. al., 2002

Because of its size, the Beaver Creek Watershed was divided into six smaller subwatersheds to display information. These six subwatersheds are Mainstem Beaver Creek, Lower Left Fork Beaver Creek, Upper Left Fork Beaver Creek, Lower Right Fork Beaver Creek, Middle Right Fork Beaver Creek, and Upper Right Fork Beaver Creek. The HUC14s that are in each of these six subwatersheds and the areas of each are in Tables 3.1 through 3.6.

Table 3.1 HUC14s in the Mainstem Beaver Creek Subwatershed

| HUC14          | NAME           | SQUARE MILES | ACRES   |
|----------------|----------------|--------------|---------|
| 05070203065050 | Beaver Creek   | 3.95         | 2526.85 |
| 05070203065030 | Beaver Creek   | 1.69         | 1081.64 |
| 05070203065020 | Buck Branch    | 2.97         | 1899.04 |
| 05070203065040 | Arkansas Creek | 3.11         | 1992.52 |
| 05070203065010 | Beaver Creek   | 0.46         | 296.17  |
| Total          |                | 12.18        | 7796.22 |

Table 3.2 HUC14s in the Lower Left Fork Beaver Creek Subwatershed

| HUC14          | NAME                   | SQUARE MILES | ACRES    |
|----------------|------------------------|--------------|----------|
| 05070203050370 | Left Fork Beaver Creek | 3.73         | 2385.93  |
| 05070203050350 | Left Fork Beaver Creek | 8.09         | 5176.96  |
| 05070203050360 | Spurlock Creek         | 3.88         | 2485.90  |
| 05070203050340 | Simpson Branch         | 1.94         | 1243.35  |
| 05070203050330 | Left Fork Beaver Creek | 0.55         | 351.97   |
| 05070203050320 | Sizemore Branch        | 1.77         | 1132.22  |
| 05070203050280 | Frasure Creek          | 1.4          | 894.80   |
| 05070203050310 | Left Fork Beaver Creek | 0.86         | 548.95   |
| 05070203050290 | Left Fork Beaver Creek | 0.39         | 250.81   |
| 05070203050270 | Hall Fork              | 1.82         | 1161.87  |
| 05070203050300 | Doty Branch            | 1.65         | 1055.67  |
| 05070203050190 | Left Fork Beaver Creek | 1.3          | 830.93   |
| 05070203050260 | Frasure Creek          | 1.09         | 698.42   |
| 05070203050250 | Hoods Fork             | 1.52         | 975.22   |
| 05070203050180 | Spewing Camp Creek     | 2.49         | 1594.18  |
| 05070203050170 | Left Fork Beaver Creek | 4.84         | 3099.27  |
| 05070203050240 | Frasure Creek          | 0.39         | 250.73   |
| 05070203050230 | Ned Fork               | 1.78         | 1138.58  |
| 05070203050220 | Frasure Creek          | 0.75         | 481.91   |
| 05070203050210 | Biglick Branch         | 0.62         | 394.79   |
| 05070203050200 | Frasure Creek          | 2.16         | 1381.14  |
| Total          |                        | 43.02        | 27533.60 |

Table 3.3 HUC14s in the Upper Left Fork Beaver Creek Subwatershed

| HUC14          | NAME                      | SQUARE MILES | ACRES    |
|----------------|---------------------------|--------------|----------|
| 05070203050160 | Clear Creek               | 5.26         | 3369.02  |
| 05070203050150 | Left Fork Beaver Creek    | 3.02         | 1929.34  |
| 05070203050110 | Left Fork Beaver Creek    | 2.20         | 1407.71  |
| 05070203050140 | Jacks Creek               | 4.10         | 2626.35  |
| 05070203050060 | Abner Fork                | 1.80         | 1196.98  |
| 05070203050070 | Left Fork Beaver Creek    | 0.88         | 562.46   |
| 05070203050100 | Otter Creek               | 0.24         | 156.22   |
| 05070203050050 | Left Fork Beaver Creek    | 0.20         | 128.34   |
| 05070203050040 | Henpen Branch             | 1.39         | 887.79   |
| 05070203050090 | Left Fork of Otter Creek  | 1            | 637.38   |
| 05070203050080 | Right Fork of Otter Creek | 2.08         | 1329.80  |
| 05070203050030 | Left Fork Beaver Creek    | 1.34         | 860.44   |
| 05070203050010 | Left Fork Beaver Creek    | 3.38         | 2163.29  |
| 05070203050020 | Caleb Fork                | 1.91         | 1222.77  |
| 05070203050130 | Frozen Fork               | 0.97         | 618.04   |
| 05070203050120 | Jacks Creek               | 0.76         | 485.74   |
| Total          |                           | 30.6         | 19581.67 |

Table 3.4 HUC14s in the Lower Right Fork Beaver Creek Subwatershed

| HUC14          | NAME                    | SQUARE MILES | ACRES    |
|----------------|-------------------------|--------------|----------|
| 05070203060760 | Stephens Branch         | 2.70         | 1730.00  |
| 05070203060770 | Right Fork Beaver Creek | 0.90         | 577.52   |
| 05070203060720 | Wilson Creek            | 3.14         | 2011.34  |
| 05070203060750 | Right Fork Beaver Creek | 4.36         | 2792.32  |
| 05070203060680 | Brush Creek             | 5.81         | 3715.94  |
| 05070203060690 | Right Fork Beaver Creek | 1.85         | 1184.05  |
| 05070203060730 | Right Fork Beaver Creek | 0.36         | 229.68   |
| 05070203060740 | Turkey Creek            | 5.3          | 3390.29  |
| 05070203060710 | Right Fork Beaver Creek | 1.59         | 1019.72  |
| 05070203060660 | Saltlick Creek          | 7.06         | 4517.03  |
| 05070203060670 | Right Fork Beaver Creek | 1.11         | 707.14   |
| 05070203060630 | Right Fork Beaver Creek | 1.72         | 1101.69  |
| 05070203060700 | Goose Creek             | 2.76         | 1767.51  |
| 05070203060650 | Lick Fork               | 1.55         | 990.10   |
| 05070203060620 | Rock Fork               | 8.33         | 5330.81  |
| 05070203060600 | Stonecoal Branch        | 1.82         | 1164.70  |
| 05070203060640 | Saltlick Creek          | 3.99         | 2551.79  |
| 05070203060610 | Right Fork Beaver Creek | 0.09         | 57.72    |
| 05070203060590 | Right Fork Beaver Creek | 0.41         | 261.51   |
| Total          |                         | 54.84        | 35100.86 |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

Table 3.5 HUC14s in the Middle Right Fork Beaver Creek Subwatershed

| HUC14          | NAME                         | SQUARE MILES | ACRES    |
|----------------|------------------------------|--------------|----------|
| 05070203060430 | Right Fork Beaver Creek      | 3.10         | 1986.23  |
| 05070203060580 | Jones Fork                   | 3.9          | 2493.63  |
| 05070203060420 | Steele Creek                 | 3.42         | 2185.61  |
| 05070203060560 | Jones Fork                   | 0.78         | 495.76   |
| 05070203060550 | Fourmile Branch              | 1.89         | 1206.82  |
| 05070203060410 | Right Fork Beaver Creek      | 0.16         | 99.36    |
| 05070203060400 | Mill Creek                   | 1.57         | 1006.39  |
| 05070203060570 | Big Springs Branch           | 1.54         | 982.63   |
| 05070203060390 | Right Fork Beaver Creek      | 1.99         | 1273.71  |
| 05070203060540 | Jones Fork                   | 0.54         | 343.52   |
| 05070203060500 | Bruce Branch                 | 0.87         | 553.74   |
| 05070203060520 | Jones Fork                   | 0.42         | 267.15   |
| 05070203060510 | Ball Branch                  | 0.25         | 160.01   |
| 05070203060530 | Bear Branch                  | 2.31         | 1477.09  |
| 05070203060490 | Ball Branch                  | 1.96         | 1251.11  |
| 05070203060380 | Caney Fork                   | 1.14         | 726.38   |
| 05070203060480 | Jones Fork                   | 1.94         | 1243.08  |
| 05070203060360 | Caney Fork                   | 7.96         | 5096.21  |
| 05070203060470 | Turtle Branch                | 0.87         | 556.30   |
| 05070203060370 | Big Branch                   | 1.03         | 656.37   |
| 05070203060460 | Jones Fork                   | 1.36         | 871.83   |
| 05070203060440 | Long Fork                    | 3.13         | 2003.84  |
| 05070203060450 | Terry Fork                   | 1.19         | 762.85   |
| 05070203060340 | Caney Fork                   | 1.07         | 681.90   |
| 05070203060350 | Hempatch Branch              | 1.09         | 699.28   |
| 05070203060300 | Caney Fork                   | 2.55         | 1632.60  |
| 05070203060330 | Hollybush Creek              | 0.64         | 407.52   |
| 05070203060320 | Left Fork of Hollybush Creek | 2.61         | 1669.22  |
| 05070203060310 | Hollybush Creek              | 3.27         | 2091.19  |
| 05070203060280 | Short Fork                   | 2.20         | 1409.01  |
| 05070203060290 | Trace Fork                   | 1.00         | 641.70   |
| Total          |                              | 57.71        | 36932.04 |

Table 3.6 HUC14s in the Upper Right Fork Beaver Creek Subwatershed

| HUC14          | NAME                    | SQUARE MILES | ACRES    |
|----------------|-------------------------|--------------|----------|
| 05070203060270 | Right Fork Beaver Creek | 2.52         | 1609.37  |
| 05070203060250 | Right Fork Beaver Creek | 1.94         | 1242.39  |
| 05070203060260 | Salisbury Branch        | 1.68         | 1072.99  |
| 05070203060240 | Patten Branch           | 1.36         | 867.02   |
| 05070203060230 | Right Fork Beaver Creek | 3.45         | 2207.83  |
| 05070203060170 | Right Fork Beaver Creek | 1.34         | 859.45   |
| 05070203060190 | Right Fork Beaver Creek | 0.19         | 122.00   |
| 05070203060220 | Dry Creek               | 1.12         | 718.88   |
| 05070203060180 | Potato Branch           | 0.9          | 575.17   |
| 05070203060160 | Hall Branch             | 1.53         | 981.89   |
| 05070203060150 | Right Fork Beaver Creek | 0.93         | 596.14   |
| 05070203060210 | Left Fork of Dry Creek  | 1.4          | 895.36   |
| 05070203060200 | Dry Creek               | 2.59         | 1657.76  |
| 05070203060130 | Right Fork Beaver Creek | 0.1          | 636.50   |
| 05070203060140 | Mullins Branch          | 1.50         | 959.76   |
| 05070203060120 | Bates Branch            | 1.60         | 1025.76  |
| 05070203060100 | Righthand Fork          | 3.77         | 2412.53  |
| 05070203060110 | Right Fork Beaver Creek | 0.03         | 15.93    |
| 05070203060090 | Right Fork Beaver Creek | 0.27         | 175.48   |
| 05070203060070 | Right Fork Beaver Creek | 0.24         | 151.37   |
| 05070203060050 | Right Fork Beaver Creek | 1.28         | 819.03   |
| 05070203060080 | Joe King Branch         | 0.90         | 575.91   |
| 05070203060060 | Puncheon Branch         | 4.25         | 2720.28  |
| 05070203060040 | Arnold Fork             | 3.51         | 2243.54  |
| 05070203060030 | Isaac Fork              | 1.03         | 660.24   |
| 05070203060020 | West Fork of Isaac Fork | 0.7          | 445.56   |
| 05070203060010 | Isaac Fork              | 1.45         | 924.53   |
| Total          |                         | 42.46        | 27172.67 |

## 3.2 Hydrology

The Beaver Creek Watershed headwater tributaries begin in Knott and Floyd counties at their southern boundary with Letcher and Pike counties and flow northward to their confluence with Levisa Fork in Floyd County. The Left Fork and Right Fork of Beaver Creek merge to form the mainstem of Beaver Creek just south of the city of Martin. KDOW follows the Strahler (1952) method for stream order determination where small upstream segments with no tributaries are first order. When two first order streams merge, they form a second order stream segment; two second order segments merge to form a third order segment and so on. In this method, a first order segment merging with a second order segment results in a continuation of the second order

segment, order only increases when segments with the same order merge or if a tributary to a main segment has a larger order. First order streams tend to be small and carry little flow except during wet weather events while larger stream orders indicate larger systems with greater flow. At its confluence with Levisa Fork, Beaver Creek is a fifth order stream, while the Left Fork and Right Fork are both fourth order at their confluence.

Stream slopes were determined using a 30M Digital Elevation Model. Elevation at the upstream end of blue line streams on a 1:24 scale was determined and the highest elevations for the Left Fork and Right Fork were selected to determine stream slope. The lowest elevation for the Right and Left Fork was assumed to be at their confluence and the lowest elevation for Beaver mainstem was assumed to be at its mouth. Figure 3.2 shows the elevation points used to determine slopes in the watershed. The highest elevation in the Left Fork of Beaver Creek is along Stonecoal Fork at 1800 ft above mean sea level (msl). The lowest elevation in the Left Fork is at its confluence with the Right Fork at 639 ft msl. The stream length along this path is 27.5 miles providing a slope in the Left Fork of 42.2 ft/mile. The highest elevation in the Right Fork is along the Left Fork of Holly Bush at 1556 ft msl. The lowest elevation is its confluence with the Left Fork at 639 msl. The stream length along this path is 35.4 miles, providing a slope in the Right Fork of 25.9 ft/mile. The mouth of Beaver Creek is at an elevation of 624 ft msl and the length from its highest point on Stonecoal Fork (1800 ft msl) to its mouth is 34.6 miles, providing a slope for Beaver Creek of 34 ft/mile. Table 3.7 summarizes the elevation and slope information.

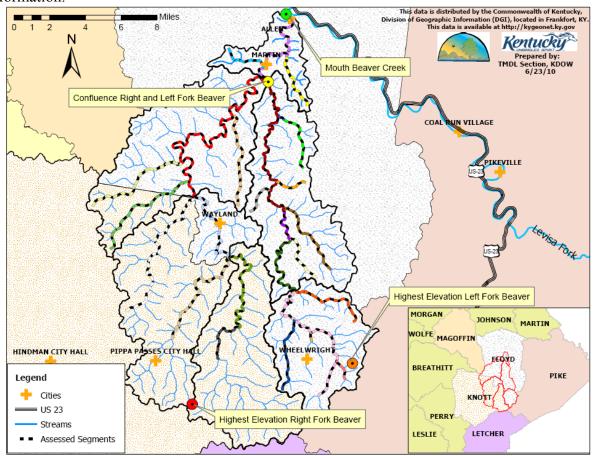


Figure 3.2 Stream Elevation Points Used to Determine Stream Slopes

Table 3.7 Beaver Creek Watershed Elevation and Slope

| Stream       | Highest<br>Elevation | Lowest Elevation   | Difference in Elevation | Length from<br>Highest to<br>Lowest | Slope        |
|--------------|----------------------|--------------------|-------------------------|-------------------------------------|--------------|
|              |                      | 639 ft             |                         |                                     |              |
| Left Fork    | 1800 ft              | Confluence of Left |                         |                                     |              |
| Beaver       | Stonecoal Fork       | and Right Fork     | 1161 ft                 | 27.5 miles                          | 42.2 ft/mile |
|              | 1556 ft              | 639 ft             |                         |                                     |              |
| Right Fork   | Left Fork            | Confluence of Left |                         |                                     |              |
| Beaver       | Holly Bush           | and Right Fork     | 917 ft                  | 35.4 miles                          | 25.9 ft/mile |
|              | 1800 ft              | 624 ft             |                         |                                     |              |
| Beaver Creek | Stonecoal Fork       | Mouth of Beaver    | 1176 ft                 | 34.6 miles                          | 34 ft/mile   |

Karst development is not expected in the Beaver Creek Watershed. Groundwater in this area is predominantly fracture flow through sandstone and some minor fracture-flow springs may occur. There is no reason to suspect groundwater flow that would deviate from the topographic hydrologic divides (KDOW, 2010b).

There are no active discharge gaging stations in the Beaver Creek watershed; however, a real-time precipitation gage, Price Precipitation Site # 372418082444201, is in operation on the Left Fork of Beaver Creek. Figure 3.3 shows the location of this precipitation gage in the watershed.

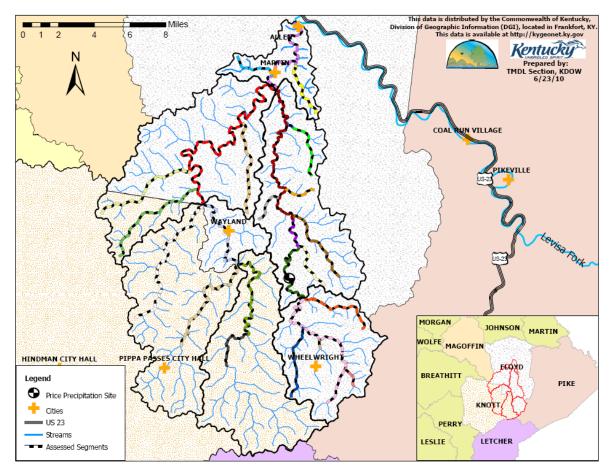


Figure 3.3 Location of Price Precipitation Gage on Left Fork Beaver Creek

There are nine water withdrawals permitted by KDOW in the Beaver Creek Watershed. Three of these are groundwater withdrawals, one is from a surface impoundment, and five are from streams. Table 3.8 displays KDOW water withdrawal permit information while Figure 3.4 shows the location and type of withdrawal. Information was obtained from the KDOW water withdrawal permits.

Table 3.8 Information for KDOW Permitted Water Withdrawals

|        | Nome           |          |           | Withdrawal                | Withdrawal   | Source             |
|--------|----------------|----------|-----------|---------------------------|--------------|--------------------|
| AI#    | Name           | Latitude | Longitude | (MGD)                     | (cfs)        | Description        |
|        |                |          |           |                           |              | Groundwater        |
|        | Wheelwright    |          |           |                           |              | from               |
| 1250   | Utility        | 27.22175 | 92.72251  | - 0.250                   | . 0.54152    | Wheelwright        |
| 1359   | Commission     | 37.32165 | -82.73251 | <=0.350                   | <=0.54153    | Mine<br>River mile |
|        | ICG Knott Co   |          |           |                           |              | 40.6 of Right      |
|        | LLC            |          |           |                           |              | Fork Beaver        |
| 2528   | (860-8012)     | 37.32166 | -82.80366 | <=0.265                   | <=0.4100156  | Creek              |
|        |                |          |           |                           |              | River mile         |
|        | Deane Mining   |          |           |                           |              | 31.0 of Right      |
|        | LLC            |          |           |                           |              | Fork Beaver        |
| 2525   | (860-5318)     | 37.41038 | -82.78096 | <=0.010                   | <=0.01547229 | Creek              |
|        |                |          |           |                           |              | River mile         |
|        |                |          |           |                           |              | 1.38 of Fourmile   |
|        |                |          |           |                           |              | Branch             |
|        | CONSOL of      |          |           |                           |              | impoundment        |
| 100130 | Kentucky Inc   | 37.43167 | -82.89833 | <=0.384                   | <=0.5941358  | off Jones Fork     |
|        |                |          |           |                           |              | Field of seven     |
|        |                |          |           |                           |              | groundwater        |
|        | Knott Co       |          |           |                           |              | wells along        |
| 44215  | Water District | 37.35042 | -82.86385 | <=0.144                   | <=0.2228009  | Caney Creek        |
|        |                |          |           | Jan. & Feb.               |              |                    |
|        |                |          |           | <=0.062;<br>Mar <=0 .064; |              |                    |
|        |                |          |           | Apr. & May <=             |              |                    |
|        |                |          |           | 0.067; Jun.               |              |                    |
|        |                |          |           | <=0.07;                   |              |                    |
|        |                |          |           | Jul., Aug. &              |              |                    |
|        |                |          |           | Sept. <=0.073;            |              | Groundwater        |
|        |                |          |           | Oct <=0.07;               | <=0.09592818 | from an            |
| 1101   | Francis Water  | 27 47522 | 02 01 (24 | Nov <=0 .066;             | to           | abandoned          |
| 1191   | Co             | 37.47522 | -82.81634 | Dec <= 0.063              | <=0.1129477  | mine<br>River mile |
|        |                |          |           |                           |              | 15.36 of Left      |
|        | Elk Horn Coal  |          |           |                           |              | Fork Beaver        |
| 1299   | Co LLC         | 37.40129 | -82.74175 | <=0.06                    | <=0.09283372 | Creek              |
|        |                |          |           |                           |              | River mile 4.2     |
|        | ICG Knott Co   |          |           |                           |              | of Caney           |
| 3502   | LLC            | 37.3884  | -82.82856 | <=0.65                    | <=1.005699   | Creek              |
|        | Black          |          |           |                           |              | River mile 2.4     |
| 70571  | Diamond        | 27.52102 | 92.74264  | - 0.422                   | . 0.6604020  | of Left Fork       |
| 78571  | Mining         | 37.53192 | -82.74364 | <=0.432                   | <=0.6684028  | Beaver Creek       |

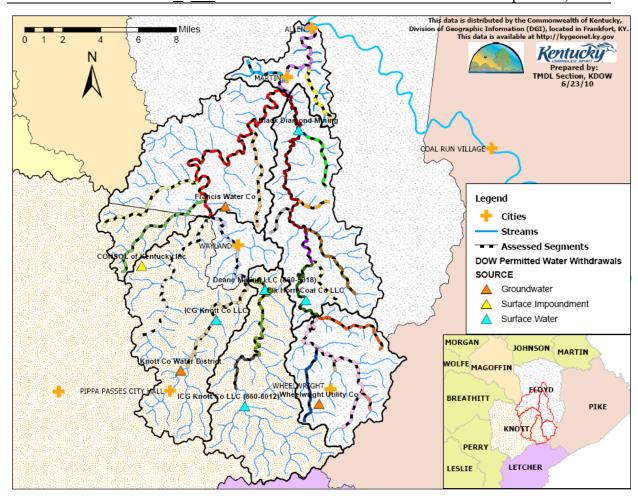


Figure 3.4 Location of KDOW Permitted Water Withdrawals in the Beaver Creek Watershed

### 3.3 Geology

The Beaver Creek watershed is underlain by Pennsylvanian rock, which developed 325 to 290 million years ago (KGS, 2010). These rocks consist of interbedded shale, sandstone, conglomerates, and coal (KGS, 2010). The major members of the Pennsylvanian rock in Eastern Kentucky are the Pennington and Lee formations and the overlying Breathitt, Conemaugh, and Monongahela formations (McDowell, 1986).

#### **3.4 Soils**

Information on soils was obtained from the U.S. Department of Agriculture Web Soil Survey. The major soil associations found in the watershed are the Hazleton-Fedscreek-Marrowbone complex, the Dekalb-Gilpin-Marrowbone complex, the Hazleton-Fedscreek-Kimper complex, the Sharondale-Hazleton-Kimper complex, the Fedscreek-Shelocta-Handshoe complex, and the Cloverlick-Shelocta-Kimper complex. Tables 3.9 through 3.14 show the soil formations found in each of the six subwatersheds. Only soils that comprise at least 1% of the subwatershed total are shown; many lesser soils have been deleted. It should be noted that the above mentioned major

soil formations tend to be on the hillsides while the loams mentioned in the tables tend to be along the streams or in the floodplains.

Table 3.9 Beaver Creek Mainstem Subwatershed Soils

| Table 3.9 Beaver Creek Mai   | listelli Suow | atersited 50. |            |                  |               |
|------------------------------|---------------|---------------|------------|------------------|---------------|
|                              |               | G             | Percent of | G .: TD 1        | G             |
|                              |               | Square        | Soil Type  | Septic Tank      | Sewage        |
|                              | Acres in      | Miles in      | in         | Absorption       | Lagoons       |
| Soil Type                    | Watershed     | Watershed     | Watershed  | Fields Rating    | Rating        |
| Hazleton-Fedscreek-          |               |               |            |                  |               |
| Marrowbone complex, 30 to    |               |               |            |                  |               |
| 80 percent slopes, very      |               |               |            |                  |               |
| stony                        | 2231          | 3.5           | 28.20      | Very limited     | Very limited  |
| Dekalb-Gilpin-Marrowbone     |               |               |            |                  |               |
| complex, 20 to 80 percent    |               |               |            |                  |               |
| slopes, very stony           | 2184.8        | 3.4           | 27.60      | Very limited     | Very limited  |
| Hazleton-Fedscreek-Kimper    |               |               |            | •                | J             |
| complex, 30 to 80 percent    |               |               |            |                  |               |
| slopes, very stony           | 993.8         | 1.6           | 12.60      | Very limited     | Very limited  |
| Sharondale-Hazleton-         |               |               |            | •                |               |
| Kimper complex, 30 to 80     |               |               |            |                  |               |
| percent slopes, extremely    |               |               |            |                  |               |
| stony                        | 800.2         | 1.3           | 10.10      | Very limited     | Very limited  |
| Myra very channery fine      |               |               |            | -                | -             |
| sandy loam, 30 to 70         |               |               |            |                  |               |
| percent slopes, stony        | 374.6         | 0.6           | 4.70       | Very limited     | Very limited  |
| Udorthents-Urban land        |               |               |            | •                |               |
| complex, 0 to 15 percent     |               |               |            |                  |               |
| slopes                       | 315.1         | 0.5           | 4.00       | Not rated        | Not rated     |
| Grigsby fine sandy loam,     |               |               |            |                  |               |
| occasionally flooded         | 205.9         | 0.3           | 2.60       | Very limited     | Very limited  |
| Potomac-Shelocta-Grigsby     |               |               |            | •                | _             |
| complex, 2 to 15 percent     |               |               |            |                  |               |
| slopes                       | 197.3         | 0.3           | 2.50       | Very limited     | Very limited  |
| Allegheny loam, 2 to 6       | 177.5         | 0.5           | 2.00       | v ery mineca     | v ery mineca  |
| percent slopes, occasionally |               |               |            |                  |               |
| flooded                      | 166           | 0.3           | 2.10       | Very limited     | Very limited  |
| Shelocta-Grigsby-Stokly      | 100           | 0.5           | 2.10       | , or j minica    | . crj mineca  |
| complex, 2 to 15 percent     |               |               |            | Somewhat         |               |
| slopes                       | 147.9         | 0.2           | 1.90       | limited          | Very limited  |
| Fairpoint-Bethesda           | 117.2         | 0.2           | 1.70       | minica           | , or y minica |
| complex, 30 to 70 percent    |               |               |            |                  |               |
| slopes, stony                | 112.1         | 0.2           | 1.40       | Very limited     | Very limited  |
| Allegheny loam, 6 to 15      | 114.1         | 0.2           | 1.40       | very minied      | very minied   |
| percent slopes, occasionally |               |               |            |                  |               |
| flooded                      | 76.5          | 0.1           | 1.00       | Very limited     | Very limited  |
| Hooded                       | 70.5          | 0.1           | 1.00       | v Ci y illillicu | very minica   |

Table 3.10 Lower Left Fork Beaver Creek Subwatershed Soils

| Table 5.10 Lower Left Fork I  |           |           | Percent of |               |              |
|-------------------------------|-----------|-----------|------------|---------------|--------------|
|                               |           | Square    | Soil Type  | Septic Tank   | Sewage       |
|                               | Acres in  | Miles in  | in         | Absorption    | Lagoons      |
| Soil Name                     | Watershed | Watershed | Watershed  | Fields Rating | Rating       |
| Sharondale-Hazleton-Kimper    |           |           |            |               |              |
| complex, 30 to 80 percent     |           |           |            |               |              |
| slopes, extremely stony       | 7986.4    | 12.5      | 30.51      | Very limited  | Very limited |
| Hazleton-Fedscreek-           |           |           |            |               |              |
| Marrowbone complex, 30 to     |           |           |            |               |              |
| 80 percent slopes, very stony | 7613      | 11.9      | 29.09      | Very limited  | Very limited |
| Dekalb-Gilpin-Marrowbone      |           |           |            |               |              |
| complex, 20 to 80 percent     |           |           |            |               |              |
| slopes, very stony            | 7087.4    | 11.1      | 27.08      | Very limited  | Very limited |
| Grigsby fine sandy loam,      |           |           |            |               |              |
| occasionally flooded          | 1076.8    | 1.7       | 4.11       | Very limited  | Very limited |
| Myra very channery fine       |           |           |            |               |              |
| sandy loam, 30 to 70 percent  |           |           |            | Somewhat      |              |
| slopes, stony                 | 600.9     | 0.9       | 2.30       | limited       | Very limited |
| Udorthents-Urban land         |           |           |            |               |              |
| complex, 0 to 15 percent      |           |           |            |               |              |
| slopes                        | 494.5     | 0.8       | 1.89       | Very limited  | Very limited |
| Potomac-Shelocta-Grigsby      |           |           |            |               |              |
| complex, 2 to 15 percent      |           |           |            |               |              |
| slopes                        | 395.1     | 0.6       | 1.51       | Very limited  | Very limited |

Table 3.11 Upper Left Fork Beaver Creek Subwatershed Soils

|                            | Acres in  | Square<br>Miles in | Percent of<br>Soil Type<br>in | Septic Tank<br>Absorption | Sewage<br>Lagoons |
|----------------------------|-----------|--------------------|-------------------------------|---------------------------|-------------------|
| Soil Name                  | Watershed | Watershed          | Watershed                     | Fields Rating             | Rating            |
| Sharondale-Hazleton-       |           |                    |                               |                           |                   |
| Kimper complex, 30 to 80   |           |                    |                               |                           |                   |
| percent slopes, extremely  |           |                    |                               |                           | Very              |
| stony                      | 6707      | 10.5               | 34.76                         | Very limited              | limited           |
| Dekalb-Gilpin-Marrowbone   |           |                    |                               |                           |                   |
| complex, 20 to 80 percent  |           |                    |                               |                           | Very              |
| slopes, very stony         | 5792.4    | 9.1                | 30.02                         | Very limited              | limited           |
| Hazleton-Fedscreek-        |           |                    |                               |                           |                   |
| Marrowbone complex, 30     |           |                    |                               |                           |                   |
| to 80 percent slopes, very |           |                    |                               |                           | Very              |
| stony                      | 5116      | 8.0                | 26.51                         | Very limited              | limited           |
| Potomac-Shelocta-Grigsby   |           |                    |                               |                           |                   |
| complex, 2 to 15 percent   |           |                    |                               |                           | Very              |
| slopes                     | 878.3     | 1.4                | 4.55                          | Very limited              | limited           |
| Udorthents-Urban land      |           |                    |                               |                           |                   |
| complex, 0 to 15 percent   |           |                    |                               |                           |                   |
| slopes                     | 298.6     | 0.5                | 1.55                          | Not rated                 | Not rated         |

Table 3.12 Lower Right Fork Beaver Creek Subwatershed Soils

| Table 3.12 Lower Right For | k Beaver Cre                          | ek Subwaters |   |              |            |
|----------------------------|---------------------------------------|--------------|---|--------------|------------|
|                            |                                       |              | Percent of                              | Septic Tank  |            |
|                            |                                       | Square       | Soil Type                               | Absorption   | Sewage     |
|                            | Acres in                              | Miles in     | in                                      | Fields       | Lagoons    |
| Soil Name                  | Watershed                             | Watershed    | Watershed                               | Rating       | Rating     |
| Dekalb-Gilpin-             | · · · · · · · · · · · · · · · · · · · | , , o        | ,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | 33           | 8          |
| Marrowbone complex, 20     |                                       |              |   |              |            |
| to 80 percent slopes, very |                                       |              |   |              | Very       |
| stony                      | 9080.1                                | 14.2         | 26.42                                   | Very limited | limited    |
| Hazleton-Fedscreek-        | 7000.1                                | 17.2         | 20.72                                   | very minica  | mmtea      |
| Marrowbone complex, 30     |                                       |              |   |              |            |
|                            |                                       |              |   |              | Vom        |
| to 80 percent slopes, very | 0/11/2                                | 12.5         | 25.05                                   | X7 1: :4 - 1 | Very       |
| stony                      | 8611.2                                | 13.5         | 25.05                                   | Very limited | limited    |
| Hazleton-Fedscreek-        |                                       |              |   |              |            |
| Kimper complex, 30 to      |                                       |              |   |              |            |
| 80 percent slopes, very    |                                       |              |   |              | Very       |
| stony                      | 4536.5                                | 7.1          | 13.20                                   | Very limited | limited    |
| Sharondale-Hazleton-       |                                       |              |   |              |            |
| Kimper complex, 30 to      |                                       |              |   |              |            |
| 80 percent slopes,         |                                       |              |   |              | Very       |
| extremely stony            | 2834.7                                | 4.4          | 8.25                                    | Very limited | limited    |
| Cloverlick-Shelocta-       |                                       |              |   |              |            |
| Kimper complex, 20 to      |                                       |              |   |              | Very       |
| 70 percent slopes, stony   | 2341.8                                | 3.7          | 6.81                                    | Very limited | limited    |
| Fedscreek-Shelocta-        | 2341.0                                | 3.7          | 0.61                                    | very minicu  | minted     |
|                            |                                       |              |   |              |            |
| Handshoe complex, 30 to    |                                       |              |   |              | <b>V</b> / |
| 80 percent slopes, very    | 10040                                 | 2.1          | 5.00                                    | 37 1: 4 1    | Very       |
| stony                      | 1994.9                                | 3.1          | 5.80                                    | Very limited | limited    |
| Grigsby fine sandy loam,   |                                       |              |   |              | Very       |
| occasionally flooded       | 1098.1                                | 1.7          | 3.19                                    | Very limited | limited    |
| Shelocta-Grigsby-Stokly    |                                       |              |   |              |            |
| complex, 2 to 15 percent   |                                       |              |   | Somewhat     | Very       |
| slopes                     | 984.8                                 | 1.5          | 2.87                                    | limited      | limited    |
| Udorthents-Urban land      |                                       |              |   |              |            |
| complex, 0 to 15 percent   |                                       |              |   |              |            |
| slopes                     | 657.3                                 | 1.0          | 1.91                                    | Not rated    | Not rated  |
| Fedscreek-Shelocta         | 327.2                                 | 1.0          | 2.71                                    | 1,0011000    |            |
| complex, 20 to 50          |                                       |              |   |              | Very       |
| percent slopes             | 460                                   | 0.7          | 1.34                                    | Very limited | limited    |
|                            | 700                                   | 0.7          | 1.57                                    | , cry minica | mmca       |
| Udorthents-Urban land      | 464                                   |              |   |              | 37         |
| complex, steep             | 401                                   | 0.6          | 1.17                                    | Not rated    | Not rated  |
| Potomac-Shelocta-          |                                       |              |   |              |            |
| Grigsby complex, 2 to 15   |                                       |              |   |              | Very       |
| percent slopes             | 379.3                                 | 0.6          | 1.10                                    | Very limited | limited    |

Table 3.13 Middle Right Fork Beaver Creek Subwatershed Soils

| Table 3.13 Middle Right Fork Beaver Creek Subwatershed Soils |           |           |            |              |           |
|--|-----------|-----------|------------|--------------|-----------|
|  |           |           | Percent of | Septic Tank  |           |
|  |           | Square    | Soil Type  | Absorption   | Sewage    |
|  | Acres in  | Miles in  | in         | Fields       | Lagoons   |
| Soil Name  | Watershed | Watershed | Watershed  | Rating       | Rating    |
| Fedscreek-Shelocta-  |           |           |            |              |           |
| Handshoe complex, 30 to                                      |           |           |            |              |           |
| 80 percent slopes, very                                      |           |           |            |              | Very      |
| stony  | 10278.7   | 16.1      | 27.91      | Very limited | limited   |
| Cloverlick-Shelocta-   |           |           |            |              |           |
| Kimper complex, 20 to  |           |           |            |              | Very      |
| 70 percent slopes, stony                                     | 10107.1   | 15.8      | 27.44      | Very limited | limited   |
| Dekalb-Gilpin-   |           |           |            |              |           |
| Marrowbone complex, 20                                       |           |           |            |              |           |
| to 80 percent slopes, very                                   |           |           |            |              | Very      |
| stony  | 9273.1    | 14.5      | 25.18      | Very limited | limited   |
| Hazleton-Fedscreek-  |           |           |            |              |           |
| Marrowbone complex, 30                                       |           |           |            |              |           |
| to 80 percent slopes, very                                   |           |           |            |              | Very      |
| stony  | 2151.9    | 3.4       | 5.84       | Very limited | limited   |
| Sharondale-Hazleton-   |           |           |            |              |           |
| Kimper complex, 30 to  |           |           |            |              |           |
| 80 percent slopes,   |           |           |            |              | Very      |
| extremely stony  | 2025      | 3.2       | 5.50       | Very limited | limited   |
| Urban land-Udorthents-                                       |           |           |            |              |           |
| Grigsby complex, 0 to 6                                      |           |           |            |              |           |
| percent slopes, rarely                                       |           |           |            |              |           |
| flooded  | 568.6     | 0.9       | 1.54       | Not rated    | Not rated |
| Kaymine, Fairpoint, and                                      |           |           |            |              |           |
| Fiveblock soils, benched,                                    |           |           |            |              |           |
| 2 to 70 percent slopes,                                      |           |           |            |              | Very      |
| very stony   | 547.6     | 0.9       | 1.49       | Very limited | limited   |
| Grigsby sandy loam,  |           |           |            |              | Very      |
| occasionally flooded   | 493.2     | 0.8       | 1.34       | Very limited | limited   |

Table 3.14 Upper Right Fork Beaver Creek Subwatershed Soils

| Table 3.14 Opper Right For   | R Deaver Cre | CK Duo waters |            |               |           |
|------------------------------|--------------|---------------|------------|---------------|-----------|
|                              |              |               | Percent of |               |           |
|                              |              | Square        | Soil Type  | Septic Tank   | Sewage    |
|                              | Acres in     | Miles in      | in         | Absorption    | Lagoons   |
| Soil Name                    | Watershed    | Watershed     | Watershed  | Fields Rating | Rating    |
| Fedscreek-Shelocta-          |              |               |            |               |           |
| Handshoe complex, 30 to      |              |               |            |               |           |
| 80 percent slopes, very      |              |               |            |               | Very      |
| stony                        | 10567.5      | 16.5          | 37.30      | Very limited  | limited   |
| Cloverlick-Shelocta-         |              |               |            |               |           |
| Kimper complex, 20 to 70     |              |               |            |               | Very      |
| percent slopes, stony        | 8161.9       | 12.8          | 28.81      | Very limited  | limited   |
| Dekalb-Gilpin-Marrowbone     |              |               |            |               |           |
| complex, 20 to 80 percent    |              |               |            |               | Very      |
| slopes, very stony           | 7185.5       | 11.2          | 25.36      | Very limited  | limited   |
| Rowdy-Grigsby complex, 0     |              |               |            |               |           |
| to 4 percent slopes,         |              |               |            |               | Very      |
| occasionally flooded         | 728.9        | 1.1           | 2.57       | Very limited  | limited   |
| Kaymine, Fairpoint, and      |              |               |            |               |           |
| Fiveblock soils, benched, 2  |              |               |            |               |           |
| to 70 percent slopes, very   |              |               |            |               | Very      |
| stony                        | 722.2        | 1.1           | 2.55       | Very limited  | limited   |
| Grigsby-Urban land           |              |               |            |               |           |
| complex, 0 to 6 percent      |              |               |            |               | Very      |
| slopes, occasionally flooded | 426.7        | 0.7           | 1.51       | Very limited  | limited   |
| Urban land-Udorthents-       |              |               |            |               |           |
| Grigsby complex, 0 to 6      |              |               |            |               |           |
| percent slopes, rarely       |              |               |            |               |           |
| flooded                      | 294.2        | 0.5           | 1.04       | Not rated     | Not rated |

### 3.5 Land Cover Distribution

The 2001 National Land Cover Dataset (USGS 2003) was used to determine the land cover within the Beaver Creek watershed. The 2001 NLCD Land Cover Class Definitions are in Appendix A. Tables 3.15 through 3.20 describe the land cover by class within the subwatershed areas. For the land cover tables, all forms of developed area (i.e., high-, medium- and low-intensity developed area, as well as developed open space), were aggregated, as were all forms of forest. This was done to simplify the source analysis. Land cover is also shown graphically in Figures 3.5 through 3.10 for each of the six subwatersheds.

The land cover figures and tables indicate that the majority of the Beaver Creek watershed is forested with little agriculture or development. The land cover figures also show that much of the developed area occurs along the streams and floodplains as opposed to the forested hillsides. The barren class includes active surface mines while reclaimed mine sites are in the grassland/herbaceous class.

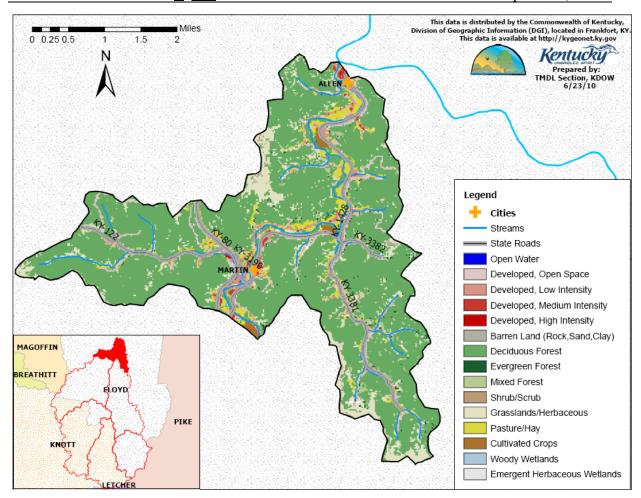


Figure 3.5 Land Cover in the Beaver Creek Mainstem Subwatershed

Table 3.15 Beaver Creek Mainstem Subwatershed Land Cover

| Land Cover |                  | Square Miles | % of Total Area |
|------------|------------------|--------------|-----------------|
| Forest     |                  | 8.91         | 73.15           |
| Develop    | oed              | 1.24         | 10.19           |
| Grasslar   | nd/ Herbaceous   | 1.16         | 9.49            |
| Agricult   | ture (total)     | 0.79         | 6.49            |
|            | Pasture/ Hay     | 0.70         | 5.75            |
|            | Cultivated Crops | 0.09         | 0.74            |
| Barren     |                  | 0.05         | 0.44            |
| Shrubla    | nd               | 0.03         | 0.26            |
| Wetland    | ls               | 0.00         | 0.03            |
| Open W     | ater             | 0.00         | 0.01            |
|            | Total            | 12.18        |                 |

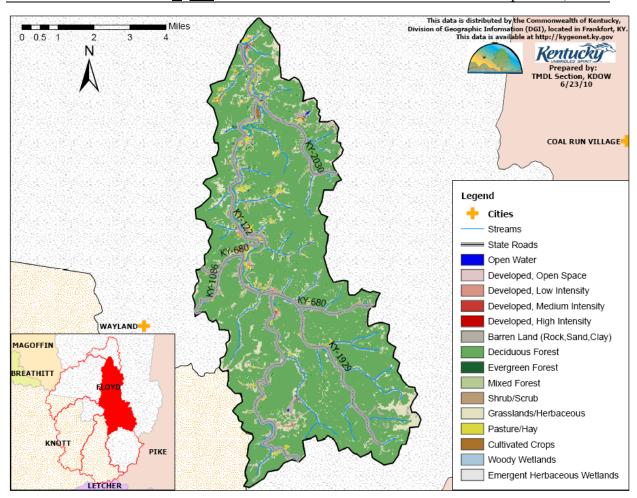


Figure 3.6 Land Cover in the Lower Left Fork Beaver Creek Subwatershed

Table 3.16 Lower Left Fork Beaver Creek Subwatershed Land Cover

| Land C   | over             | Square Miles | % of Total Area |
|----------|------------------|--------------|-----------------|
| Forest   |                  | 34.32        | 79.77           |
| Develop  | oed              | 2.96         | 6.87            |
| Grasslar | nd/ Herbaceous   | 3.48         | 8.10            |
| Agricult | ture (total)     | 1.67         | 3.9             |
|          | Pasture/ Hay     | 1.56         | 3.64            |
|          | Cultivated Crops | 0.11         | 0.25            |
| Barren   |                  | 0.49         | 1.14            |
| Shrublar | nd               | 0.08         | 0.18            |
| Wetland  | ls               | 0.01         | 0.02            |
| Open W   | ater             | 0.02         | 0.05            |
|          | Total            | 43.02        |                 |

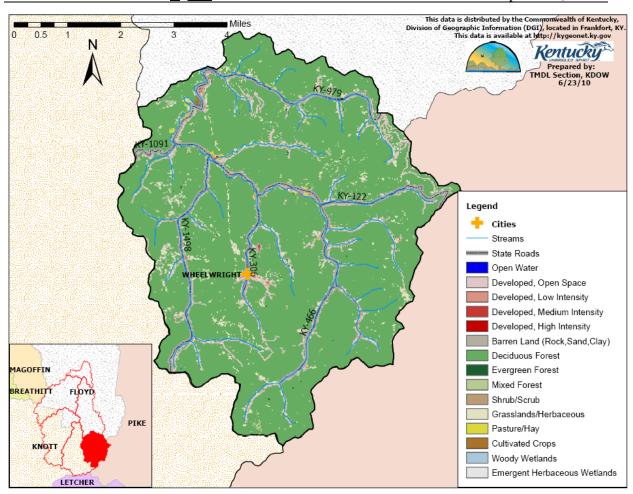


Figure 3.7 Land Cover in the Upper Left Fork Beaver Creek Subwatershed

Table 3.17 Upper Left Fork Beaver Creek Subwatershed Land Cover

| Land Cover            | Square Miles | % of Total Area |
|-----------------------|--------------|-----------------|
| Forest                | 26.27        | 85.87           |
| Developed             | 2.08         | 6.80            |
| Grassland/ Herbaceous | 1.62         | 5.30            |
| Agriculture (total)   | 0.32         | 1.05            |
| Pasture/ Hay          | 0.28         | 0.93            |
| Cultivated Crops      | 0.04         | 0.12            |
| Barren                | 0.27         | 0.89            |
| Shrubland             | 0.03         | 0.09            |
| Wetlands              | 0.00         | 0.00            |
| Open Water            | 0.00         | 0.00            |
| Total                 | 30.60        |                 |

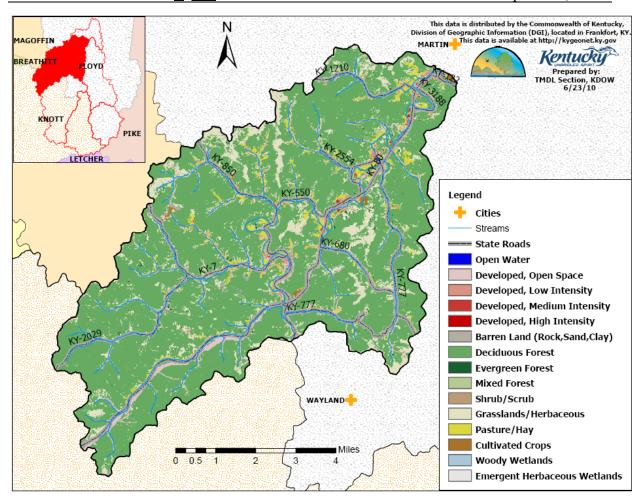


Figure 3.8 Land Cover in the Lower Right Fork Beaver Creek Subwatershed

Table 3.18 Lower Right Fork Beaver Creek Subwatershed Land Cover

| Land Cover            | Square Miles | % of Total Area |  |
|-----------------------|--------------|-----------------|--|
| Forest                | 41.13        | 74.99           |  |
| Developed             | 4.24         | 7.73            |  |
| Grassland/ Herbaceous | 5.88         | 10.73           |  |
| Agriculture (total)   | 3.07         | 5.59            |  |
| Pasture/ Hay          | 2.88         | 5.24            |  |
| Cultivated Crops      | 0.19         | 0.34            |  |
| Barren                | 0.38         | 0.69            |  |
| Shrubland             | 0.13         | 0.24            |  |
| Wetlands              | 0.01         | 0.03            |  |
| Open Water            | 0.00         | 0.01            |  |
| Total                 | 54.85        | _               |  |

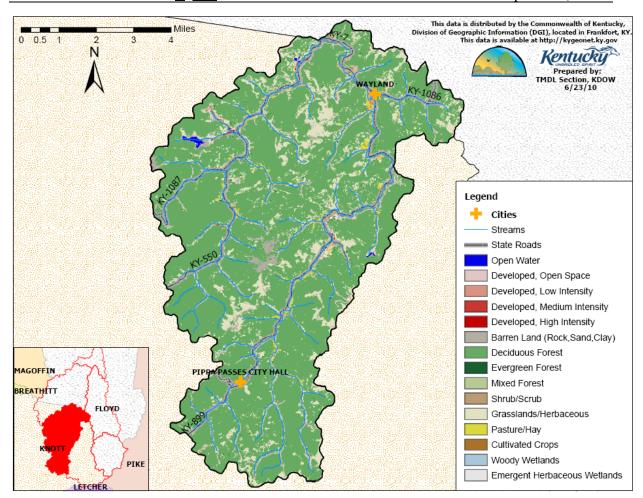


Figure 3.9 Land Cover in the Middle Right Fork Beaver Creek Subwatershed

Table 3.19 Middle Right Fork Beaver Creek Subwatershed Land Cover

| Land C     | over             | Square Miles | % of Total Area |  |
|------------|------------------|--------------|-----------------|--|
| Forest     |                  | 45.17        | 78.27           |  |
| Develop    | oed              | 2.80         | 4.85            |  |
| Grasslar   | nd/ Herbaceous   | 7.33         | 12.71           |  |
| Agricult   | ture (total)     | 1.20         | 2.08            |  |
|            | Pasture/ Hay     | 1.15         | 1.99            |  |
|            | Cultivated Crops | 0.05         | 0.08            |  |
| Barren     |                  | 0.99         | 1.72            |  |
| Shrubla    | nd               | 0.11         | 0.20            |  |
| Wetlands   |                  | 0.01         | 0.01            |  |
| Open Water |                  | 0.10         | 0.17            |  |
|            | Total            | 57.71        |                 |  |

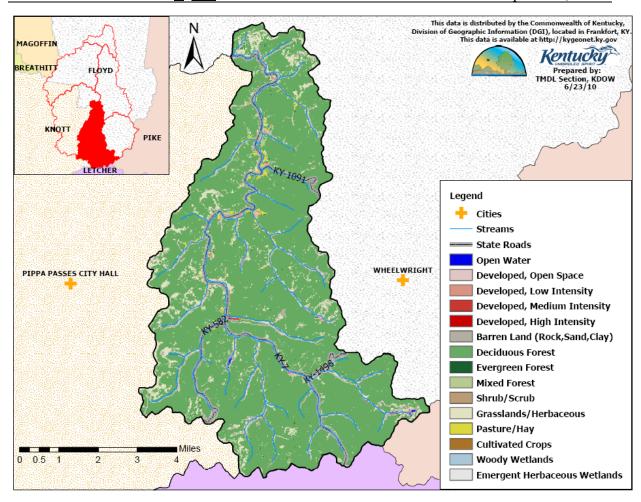


Figure 3.10 Land Cover in the Upper Right Fork Beaver Creek Subwatershed

Table 3.20 Upper Right Fork Beaver Creek Subwatershed Land Cover

| Land C   | over             | Square Miles | % of Total Area |  |
|----------|------------------|--------------|-----------------|--|
| Forest   |                  | 35.23        | 82.97           |  |
| Develop  | oed              | 2.24         | 5.29            |  |
| Grasslar | nd/ Herbaceous   | 3.68         | 8.68            |  |
| Agricult | ture (total)     | 0.71         | 1.66            |  |
|          | Pasture/ Hay     | 0.68         | 1.61            |  |
|          | Cultivated Crops | 0.02         | 0.05            |  |
| Barren   |                  | 0.52         | 1.23            |  |
| Shrublar | nd               | 0.06         | 0.13            |  |
| Wetlands |                  | 0.00         | 0.00            |  |
| Open W   | ater             | 0.02         | 0.04            |  |
|          | Total            | 42.46        |                 |  |

# 4.0 Pathogen Indicator Monitoring Data

In 1997, Kentucky adopted a Watershed Management Framework under which monitoring is targeted in a specific basin unit during a specified year. Monitoring began with the Kentucky River Basin during 1998, then the Salt/Licking Basin in 1999, the Cumberland/ Mississippi/Ohio/Tennessee in 2000, the Green/Tradewater in 2001, and the Big Sandy/Little Sandy/Tygarts in 2002. This first cycle of monitoring focused on obtaining a snapshot of conditions of Kentucky's waters, especially wadeable streams. The second cycle of the Watershed Framework schedule again began with the Kentucky Basin in 2004 and ended with the Sandy/Little/Sandy/Tygarts in 2007. This second cycle of monitoring focused on impaired watersheds; however, monitoring for other purposes was also conducted. KDOW has several monitoring programs to monitor biological and water quality indicators, which are highlighted in Table 4.1. Details about the programs can be found in the 2008 Integrated Report to Congress on Water Quality in Kentucky Volume 1, 305(b) Report (KDOW, 2008b).

**Table 4.1 KDOW Monitoring Programs** 

|                         | Long-<br>term<br>Surface<br>Water<br>(a) | Rotating<br>Surface<br>Water<br>(a) | Targeted<br>Biological<br>Monitoring<br>(b, c) | Reference<br>Reach (b) | Probabilistic<br>Biosurvey<br>(d) | Lake<br>monitoring<br>(e) | Ground-<br>water &<br>Springs<br>Monitoring<br>(a) |
|-------------------------|--|-------------------------------------|--|------------------------|-----------------------------------|---------------------------|--|
| Streams (1st-5th order) |  | X                                   | X  | X                      | X                                 | (-)                       | (1)  |
| Large Rivers            | X  | X                                   | X  |                        |                                   |                           |  |
| Lakes/Reservoirs        |  |                                     |  |                        |                                   | X                         |  |
| Groundwater             |  |                                     |  |                        |                                   |                           | X  |

- (a) Indicators: physicochemical and pathogen indicator
- (b) Indicators: macroinvertebrates, fish, algae, physicochemical, habitat
- (c) Includes some 6<sup>th</sup> order streams where wadeable and associated with ambient water quality stations
- (d) Indicators: macroinvertebrates, physicochemical, habitat
- (e) Indicators: physicochemical, fish kills, macrophytes, algae

The PCR use for pathogens can initially be monitored and assessed under three different programs, Long-term Surface Water, Rotating Surface Water, or Groundwater and Springs Monitoring. Under the Kentucky Watershed Management Framework, Long-term stations are fixed, permanent sampling sites located in the downstream and mid-unit reaches of USGS 8-digit HUCs, upstream of major reservoirs and in the downstream reaches of major tributaries. The long-term stations of a watershed management unit are sampled monthly during the year the unit is in the monitoring phase of the watershed cycle. During the other four years of the watershed cycle, sampling frequency is reduced to bimonthly. The Beaver Creek watershed has one Longterm station (PRI095) located at RM 1.3 of Beaver Creek. Rotating watershed stations are selected for intensive monthly sampling for one year during the monitoring portion of the fiveyear watershed cycle. These are usually located at the downstream reaches of USGS 11-digit HUC watersheds, and many were coupled with biological sampling and with USGS gauging stations. Groundwater and Springs Monitoring is performed as needed. Once a segment is identified as impaired, monitoring for TMDL development may be performed. TMDL monitoring sites are typically located in the initial impaired segment(s) and areas upstream of and major tributaries to these segments. KDOW follows water quality sample collection and

preservation procedures found in its water quality monitoring standard operating procedures (KDOW, 2005b).

## 4.1 Historical Monitoring

Beaver Creek RM 0.0 to 7.1 was initially listed as nonsupport of the PCR use due to pathogens on the 2004 303(d) list. This listing was due in part to discharge monitoring reports (DMRs) from the Martin Sewage Treatment Plant. The Right Fork of Beaver Creek was not listed during 2004 but was indicated to be threatened for the PCR use. The 2004 listing for Beaver Creek was carried forward to the 2006 303(d) list when the Right Fork of Beaver Creek from RM 0.0 to 17.4 was also listed as nonsupport for pathogens. During the 2008 listing cycle, these pathogen listings were more correctly identified with the indicator organism used; in this case fecal coliform.

## **4.2 TMDL Monitoring**

To obtain information for TMDL development, KDOW contracted with Eastern Kentucky University (EKU) to collect  $\underline{E}$ .  $\underline{coli}$  data at 33 sites in the Beaver Creek watershed during the 2007 and 2008 PCR season (Figure 4.1). This sampling was performed by the students and staff of the Eastern Kentucky Environmental Research Institute at EKU under the direction of Dr. Alice Jones and Environmental Specialist Reagan Butcher. The assessment results from this monitoring effort indicated that many additional stream segments within the watershed were impaired for the PCR use due to the pathogen indicator  $\underline{E}$ .  $\underline{coli}$ . On the draft 2010 list, these additional segments were listed for  $\underline{E}$ .  $\underline{coli}$  and the previously mentioned segments were carried forward, resulting in the 22 proposed listings shown in Table 4.2. To show greater detail, Figures 4.2 through 4.7 display the sample sites by subwatershed. The  $\underline{E}$ .  $\underline{coli}$  data submitted by Eastern Kentucky University, along with data from the Long-term site PRI095 is shown in Appendix B.

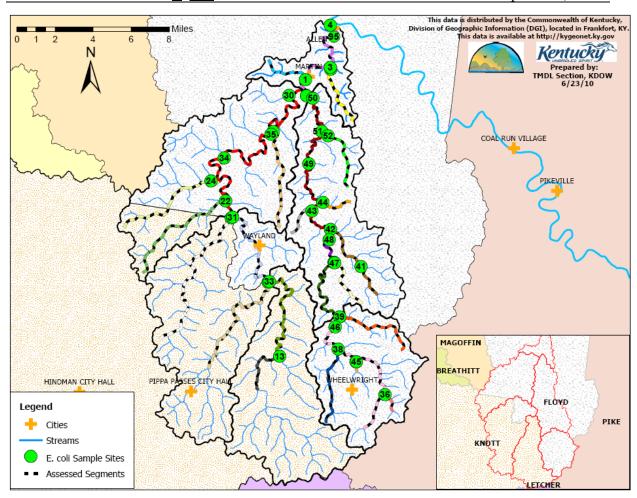


Figure 4.1 E. coli Sample Sites in the Beaver Creek Watershed

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 2 is under site 3, site 30a is to the immediate left of site 50, Site 27 is under site 35, site 20 is under site 31, site 32 is under site 33, site 37 is under site 45 and site 40 is under site 47.

Table 4.2 Proposed Pathogen Indicator Impaired Segments in Beaver Creek Watershed

| Waterbody & Segment | County | Support<br>Status | Use | Pollutant          | Suspected Source(s)                              |
|---------------------|--------|-------------------|-----|--------------------|--|
| Segment             | County | Status            | USC | 1 Offutalit        | Suspected Source(s)                              |
| Arkansas            |        |                   |     |                    |  |
| Creek 0.0 to        |        |                   |     | <b>Escherichia</b> | On-Site Treatment Systems (Septic Systems and    |
| 3.6                 | Floyd  | Nonsupport        | PCR | <u>coli</u>        | Similar Decentralized Systems)                   |
|                     |        |                   |     |                    | Municipal (Urbanized High Density Area), On-     |
|                     |        |                   |     |                    | Site Treatment Systems (Septic Systems and       |
|                     |        |                   |     |                    | Similar Decentralized Systems), Package Plant or |
| Beaver Creek        |        |                   |     | Escherichia        | Other Permitted Small Flows Discharges,          |
| 0.0 to 7.1          | Floyd  | Nonsupport        | PCR | coli               | Unspecified Domestic Waste                       |
| Buck Branch         |        |                   |     | Escherichia        | On-Site Treatment Systems (Septic Systems and    |
| 0.0 to 2.8          | Floyd  | Nonsupport        | PCR | <u>coli</u>        | Similar Decentralized Systems)                   |
| Caleb Fork          |        |                   |     | Escherichia        | On-Site Treatment Systems (Septic Systems and    |
| 0.0 to 1.2          | Floyd  | Nonsupport        | PCR | <u>coli</u>        | Similar Decentralized Systems)                   |

| Waterbody &                                | Country | Support            | Llas        | Dallutant                              | Command Comman(a)   |
|--|---------|--------------------|-------------|--|---|
| Segment                                    | County  | Status             | Use         | Pollutant                              | Suspected Source(s)   |
| Caney Fork 0.0 to 7.5                      | Knott   | Nonsupport         | PCR         | Escherichia<br>coli                    | Package Plant or Other Permitted Small Flows<br>Discharges  |
| Clear Creek<br>0.0 to 4.9                  | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |
| Frasure Creek 0.0 to 5.2                   | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and<br>Similar Decentralized Systems), Package Plant or<br>Other Permitted Small Flows Discharges |
| Jacks Creek<br>0.0 to 4.4                  | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |
| Jones Fork<br>0.0 to 9.9                   | Knott   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |
| Left Fork<br>Beaver Creek<br>0.0 to 11.4   | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and<br>Similar Decentralized Systems), Package Plant or<br>Other Permitted Small Flows Discharges |
| Left Fork<br>Beaver Creek<br>11.4 to 13.55 | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and<br>Similar Decentralized Systems), Package Plant or<br>Other Permitted Small Flows Discharges |
| Left Fork<br>Beaver Creek<br>18.7 to 28.6  | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |
| Otter Creek 0.0 to 0.5                     | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | Package Plant or Other Permitted Small Flows<br>Discharges  |
| Right Fork<br>Beaver Creek<br>0.0 to 17.4  | Floyd   | Nonsupport         | PCR,<br>SCR | Escherichia<br>coli, Fecal<br>coliform | Inappropriate Waste Disposal  |
| Right Fork<br>Beaver Creek<br>17.4 to 23.3 | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and<br>Similar Decentralized Systems), Package Plant or<br>Other Permitted Small Flows Discharges |
| Right Fork<br>Beaver Creek<br>30.3 to 33.4 | Knott   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and<br>Similar Decentralized Systems), Package Plant or<br>Other Permitted Small Flows Discharges |
| Salt Lick<br>Creek 0.0 to<br>6.8           | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |
| Simpson<br>Branch 0.0 to<br>1.8            | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |
| Sizemore<br>Branch 0.0 to<br>2.0           | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |
| Spewing<br>Camp Branch<br>0.0 to 3.1       | Floyd   | Partial<br>Support | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |
| Spurlock<br>Creek 0.0 to<br>0.6            | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |
| Turkey Creek 0.0 to 5.9                    | Floyd   | Nonsupport         | PCR         | Escherichia coli                       | On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)  |

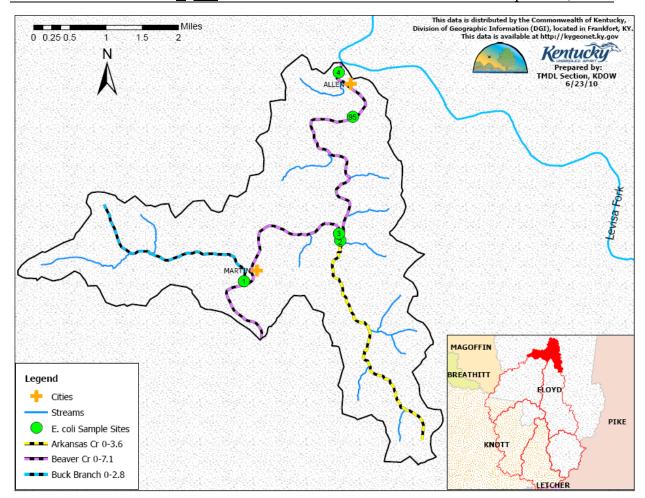


Figure 4.2 Assessed Segments and  $\underline{E}$ .  $\underline{coli}$  Sample Sites in the Beaver Creek Mainstem Subwatershed

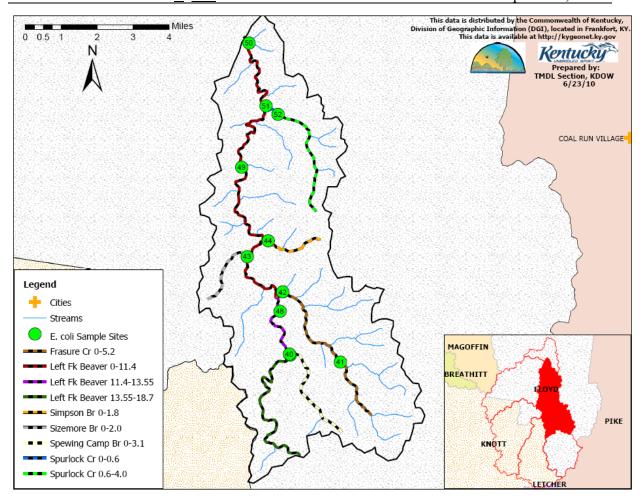


Figure 4.3 Assessed Segments and  $\underline{E}$ .  $\underline{coli}$  Sample Sites in the Lower Left Fork Beaver Creek Subwatershed.

Note: Spurlock Creek 0.0 to 0.6 is between sites 51 and 52. Due to map resolution, some sites are masked by symbols for other sites. Site 47 is under site 40.

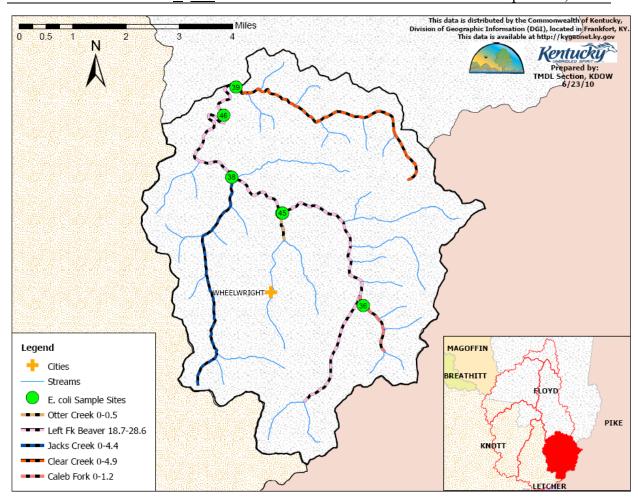


Figure 4.4 Assessed Segments and  $\underline{E}$ .  $\underline{coli}$  Sample Sites in the Upper Left Fork Beaver Creek Subwatershed

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 37 is under site 45.

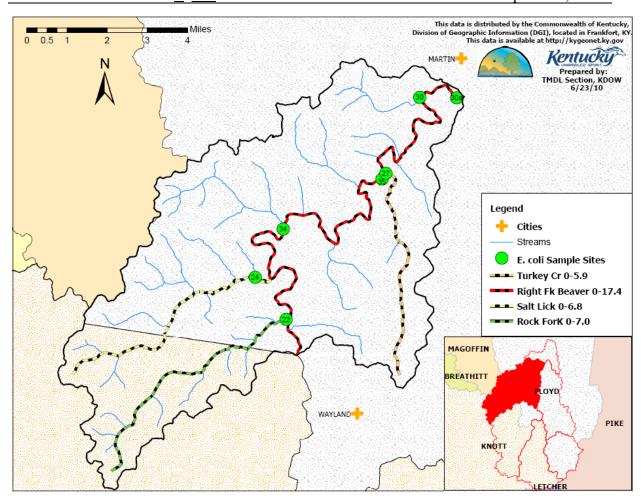


Figure 4.5 Assessed Segments and  $\underline{E}$ .  $\underline{coli}$  Sample Sites in the Lower Right Fork Beaver Creek Subwatershed

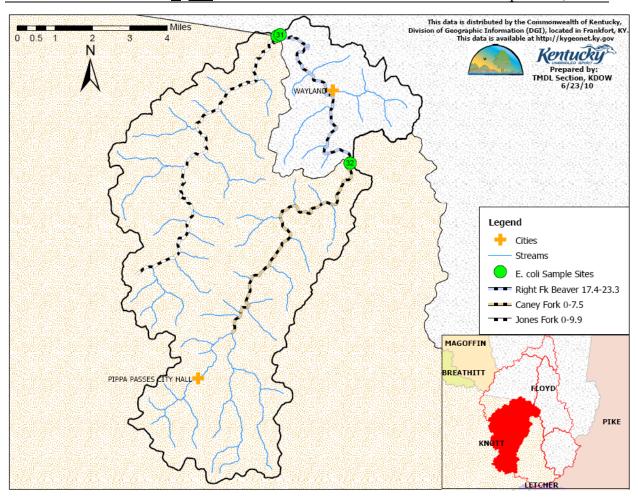


Figure 4.6 Assessed Segments and  $\underline{E}$ .  $\underline{coli}$  Sample Sites in the Middle Right Fork Beaver Creek Subwatershed

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 20 is under site 31.

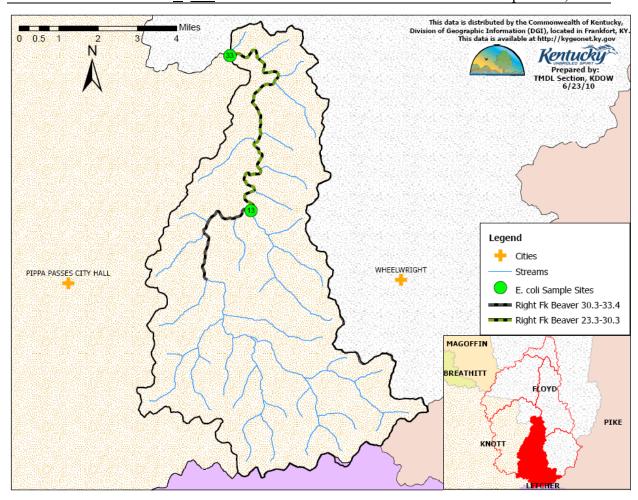


Figure 4.7 Assessed Segments and  $\underline{E}$ .  $\underline{coli}$  Sample Sites in the Upper Right Fork Beaver Creek Subwatershed

# 5.0 Source Analysis

For regulatory purposes, the sources of <u>E. coli</u> in a watershed can be placed into two broad categories: KPDES-permitted and non KPDES-permitted sources. A KPDES-permitted source requires a Kentucky Pollutant Discharge Elimination System (KPDES) discharge permit, a Storm Water permit, or a Municipal Separate Storm Sewer System (MS4) permit from the KDOW. KPDES discharge permits include wastewater treatment facilities that discharge directly to a stream, facilities discharging storm water, and some agricultural operations. The KPDES is not the only permitting program that may affect water quality or quantity within a watershed; other permitting examples include water withdrawal permits, permits to build structures within a floodplain, permits to construct an on-site sewage treatment disposal system (OSTDS), and permits to land apply waste from sewage treatment plants. However, within the framework of the TMDL process a KPDES-permitted source is defined as one regulated under the KPDES program.

A non KPDES-permitted source does not include surface or ground water dischargers regulated by the KPDES program but does include nonpoint sources of pollution. Nonpoint sources of pollution are caused by runoff from precipitation over and/or through the ground and are correlated to land use.

### 5.1 KPDES-Permitted Sources (assigned a WLA)

Permitted sources include all sources regulated by the KPDES permitting program. In 401 KAR 10:001, KDOW adopted the definition of a point source per 33 U.S.C. 1362(14) as "any discernable, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, or concentrated animal feeding operation or vessel or other floating craft, from which pollutants are or may be discharged." However, 401 KAR 10:001 exempts "agricultural storm water run-off or return flows from irrigated agriculture" from the definition of a point source. A Waste Load Allocation (WLA) is assigned to KPDES-permitted sources.

### **5.1.1 Sanitary Wastewater Dischargers**

The KPDES program issues discharge permits to facilities that treat sanitary wastewater, among other types. These facilities can be large publicly owned treatment works (POTWs) that service thousands of households and businesses, small, privately operated package facilities that service one business or one residential development, or a home unit that services an individual residence.

KPDES-permitted sanitary wastewater discharges are located within the Beaver Creek watershed (Table 5.1. and Figure 5.1). There are certainly other KPDES-permitted facilities in the impaired watersheds; however, those identified in this report treat sanitary wastewater and contribute an <u>E</u>. <u>coli</u> (or fecal coliform) load to an impaired segment. Facilities in Table 5.1 receive WLAs. The location of sources by subwatershed are shown in Figures 5.2 through 5.7.

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

Table 5.1 KPDES-permitted Sources of  $\underline{E}$ .  $\underline{coli}$  (or Fecal Coliform) in Beaver Creek Watershed. AI # indicates Agency Interest number, an internal identification number.

| KPDES#                                 | Name                   | Type                             | AI#    | Latitude             | Longitude    |
|--|------------------------|----------------------------------|--------|----------------------|--------------|
|  | CONSOL OF KY           | BITUMINOUS COAL                  |        |                      |              |
| KY0094510                              | INC JONES FORK         | & LIG, SURFACE                   | 2514   | 37.432222            | -82.874722   |
|  | MCDOWELL               |                                  |        |                      |              |
|  | DOLLAR                 | DEPARTMENT                       |        |                      |              |
| KY0103136                              | GENERAL STORE          | STORE                            | 1263   | 37.458333            | -82.749166   |
|  |                        |                                  |        |                      |              |
|  | ALLEN CENTRAL          |                                  |        |                      |              |
| KY0079430                              | HIGH SCHOOL            | SCHOOL                           | 35254  | 37.518055            | -82.808333   |
| ******                                 | BEAVER CREEK           | a arroot                         | 22045  | 0.7.0.7.1.1.1        | 00.01000     |
| KY0077542                              | ELEM SCHOOL            | SCHOOL                           | 33945  | 37.351111            | -82.812222   |
| 17170000015                            | JAMES A DUFF           | aguesi                           | 25250  | 27.500222            | 00.015555    |
| KY0093017                              | ELEM SCHOOL            | SCHOOL                           | 35258  | 37.508333            | -82.815555   |
| 1/1/000707/                            | JONES FORK             | COLLOOL                          | 25250  | 27 417500            | 00.070166    |
| KY0087076                              | ELEM SCHOOL            | SCHOOL                           | 35359  | 37.417500            | -82.879166   |
| 1/1/00/70 /01                          | MCDOWELL ELEM          | CCHOOL                           | 25252  | 27 452000            | 00 50 (111   |
| KY0079421                              | SCHOOL                 | SCHOOL                           | 35252  | 37.453888            | -82.736111   |
| *****                                  | OSBORNE ELEM           | CCHOOL                           |        |                      |              |
| KY0089435                              | SCHOOL                 | SCHOOL                           | 35251  | 37.363611            | -82.730277   |
|  | SOUTH FLOYD            | agricor                          |        |                      |              |
| KY0093912                              | HIGH SCHOOL            | SCHOOL                           | 35260  | 37.385298            | -82.735564   |
|  | MAY VALLEY             |                                  |        |                      |              |
| KY0106755                              | ELEM SCHOOL            | SCHOOL                           | 82092  | 37.3569174           | -82.778872   |
| *****                                  | GOLDEN YEARS           | INTERMEDIATE                     |        |                      |              |
| KY0083089                              | REST HOME              | CARE FACILITY                    | 2517   | 37.463611            | -82.833611   |
| ************************************** | ALLEN                  | DWELLING OTHER                   | 1100   | 25.55550             | 00.504444    |
| KYG400642                              | RESIDENCE              | THAN APARTMENT                   | 1133   | 37.552500            | -82.784444   |
| 17370701107                            | BARTLEY                | DWELLING OTHER                   | 4.40.5 | 27 420555            | 00.707777    |
| KYG401197                              | RESIDENCE              | THAN APARTMENT                   | 4405   | 37.430555            | -82.727777   |
| 1/3//040102/                           | BENTLEY                | DWELLING OTHER                   | 70042  | 27.577222            | 00.705077    |
| KYG401936                              | RESIDENCE              | THAN APARTMENT                   | 79842  | 37.577222            | -82.725277   |
| KYG400753                              | BINGHAM<br>RESIDENCE   | DWELLING OTHER<br>THAN APARTMENT | 1237   | 37.387777            | -82.706388   |
| K 1 U400/33                            |                        |                                  | 1237   | 37.387777            | -82.700388   |
| KYG400479                              | BLACKBURN<br>RESIDENCE | DWELLING OTHER THAN APARTMENT    | 1143   | 37.485277            | -82.740555   |
| K I U4004/9                            | BLANKENSHIP            | DWELLING OTHER                   | 1143   | 37.483277            | -62.740333   |
| KYG401692                              | RESIDENCE              | THAN APARTMENT                   | 50021  | 37.419444            | -82.688888   |
| K1 0401092                             | CARRAWAY               | DWELLING OTHER                   | 30021  | 37.413444            | -02.000000   |
| KYG400787                              | RESIDENCE              | THAN APARTMENT                   | 1158   | 37.576388            | -82.776388   |
| IX I G 700 / 0 /                       | KEDIDERCE              | DWELLING OTHER                   | 1130   | 31.310300            | 02.770300    |
| KYG400692                              | CASE RESIDENCE         | THAN APARTMENT                   | 1161   | 37.505833            | -82.711944   |
| 11 0 1000/2                            | CASTLE                 | DWELLING OTHER                   | 1101   | 37.303033            | 02./11/TT    |
| KYG400678                              | RESIDENCE              | THAN APARTMENT                   | 1162   | 37.518611            | -82.721666   |
| 121 0 100070                           | CASTLE                 | DWELLING OTHER                   | 1102   | 37.210011            | 02.721000    |
|  | CILCILL                |                                  | 10.50  | 2= 40=22             | 00.051666    |
| KYG401113                              | RESIDENCE              | I THAN APARTMENT                 | 4350   | 1 37. <b>49</b> 7222 | 1 -82.851666 |
| KYG401113                              | RESIDENCE<br>CAUDILL   | THAN APARTMENT DWELLING OTHER    | 4350   | 37.497222            | -82.851666   |

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| KPDES#    | Name            | Туре           | AI#   | Latitude  | Longitude  |
|-----------|-----------------|----------------|-------|-----------|------------|
|           | CHILDERS        | DWELLING OTHER |       |           |            |
| KYG401603 | RESIDENCE       | THAN APARTMENT | 46147 | 37.411666 | -82.851111 |
|           | COCHRAN         | DWELLING OTHER |       |           |            |
| KYG401646 | RESIDENCE       | THAN APARTMENT | 48897 | 37.375833 | -82.733611 |
|           | COLLINS         | DWELLING OTHER |       |           |            |
| KYG400854 | RESIDENCE       | THAN APARTMENT | 1168  | 37.452222 | -82.778611 |
|           | COLLINS         | DWELLING OTHER |       |           |            |
| KYG401516 | RESIDENCE       | THAN APARTMENT | 1168  | 37.452500 | -82.778333 |
|           | COMBS           | DWELLING OTHER |       |           |            |
| KYG401821 | RESIDENCE       | THAN APARTMENT | 74243 | 37.457222 | -82.737500 |
|           |                 | DWELLING OTHER |       |           |            |
| KYG400790 | COOK RESIDENCE  | THAN APARTMENT | 1173  | 37.377777 | -82.688611 |
|           |                 | DWELLING OTHER |       |           |            |
| KYG402025 | COOK RESIDENCE  | THAN APARTMENT | 84292 | 37.526666 | -82.775277 |
|           | COOLEY          | DWELLING OTHER |       |           |            |
| KYG401143 | RESIDENCE       | THAN APARTMENT | 4331  | 37.576111 | -82.730555 |
|           |                 | DWELLING OTHER |       |           |            |
| KYG401125 | CRUM RESIDENCE  | THAN APARTMENT | 4336  | 37.441111 | -82.794722 |
|           | CURRENT         | DWELLING OTHER |       |           |            |
| KYG400659 | RESIDENCE       | THAN APARTMENT | 4250  | 37.535833 | -82.748611 |
|           | DEROSSETT       | DWELLING OTHER |       |           |            |
| KYG400520 | RESIDENCE       | THAN APARTMENT | 1180  | 37.577777 | -82.784722 |
|           | DINGUS          | DWELLING OTHER |       |           |            |
| KYG401582 | RESIDENCE       | THAN APARTMENT | 45073 | 37.563055 | -82.738611 |
|           |                 | DWELLING OTHER |       |           |            |
| KYG400614 | DYE RESIDENCE   | THAN APARTMENT | 1182  | 37.445277 | -82.724722 |
|           |                 | DWELLING OTHER |       |           |            |
| KYG401140 | DYE RESIDENCE   | THAN APARTMENT | 4333  | 37.401388 | -82.740000 |
|           | EVERIDGE        | DWELLING OTHER |       |           |            |
| KYG401352 | RESIDENCE       | THAN APARTMENT | 15807 | 37.532222 | -82.829444 |
|           | FRASURE         | DWELLING OTHER |       |           |            |
| KYG401121 | RESIDENCE       | THAN APARTMENT | 4344  | 37.527777 | -82.790000 |
|           | GEARHEART       | DWELLING OTHER |       |           |            |
| KYG401587 | RESIDENCE       | THAN APARTMENT | 45396 | 37.471944 | -82.763888 |
|           | GOBLE           | DWELLING OTHER |       |           |            |
| KYG400590 | RESIDENCE       | THAN APARTMENT | 1196  | 37.531944 | -82.870000 |
|           | GREEN           | DWELLING OTHER |       |           |            |
| KYG400603 | RESIDENCE       | THAN APARTMENT | 1199  | 37.495277 | -82.855555 |
|           |                 | DWELLING OTHER |       |           |            |
| KYG400969 | HALL RESIDENCE  | THAN APARTMENT | 1202  | 37.451388 | -82.700277 |
|           |                 | DWELLING OTHER |       |           |            |
| KYG401475 | HALL RESIDENCE  | THAN APARTMENT | 74185 | 37.483333 | -82.898333 |
|           |                 | DWELLING OTHER |       |           |            |
| KYG401590 | HALL RESIDENCE  | THAN APARTMENT | 45070 | 37.436111 | -82.758888 |
|           | HARVEL          | DWELLING OTHER |       |           |            |
| KYG401931 | RESIDENCE       | THAN APARTMENT | 79525 | 37.453888 | -82.695833 |
|           |                 | DWELLING OTHER |       |           |            |
| KYG400567 | HICKS RESIDENCE | THAN APARTMENT | 1218  | 37.455000 | -82.773611 |

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| KPDES#    | Name            | Type           | AI#    | Latitude  | Longitude  |
|-----------|-----------------|----------------|--------|-----------|------------|
|           | HOOVER          | DWELLING OTHER |        |           |            |
| KYG400730 | RESIDENCE       | THAN APARTMENT | 1222   | 37.533333 | -82.867777 |
|           | HOPKINS         | DWELLING OTHER |        |           |            |
| KYG402002 | RESIDENCE       | THAN APARTMENT | 82471  | 37.472500 | -82.761388 |
|           | HOWELL          | DWELLING OTHER |        |           |            |
| KYG401040 | RESIDENCE       | THAN APARTMENT | 4356   | 37.451944 | -82.695000 |
|           | JACOBS          | DWELLING OTHER |        |           |            |
| KYG400806 | RESIDENCE       | THAN APARTMENT | 1232   | 37.582222 | -82.793333 |
|           |                 | DWELLING OTHER |        |           |            |
| KYG401133 | JONES RESIDENCE | THAN APARTMENT | 4349   | 37.353611 | -82.735555 |
|           | JUSTICE         | DWELLING OTHER |        |           |            |
| KYG401699 | RESIDENCE       | THAN APARTMENT | 50138  | 37.608333 | -82.736111 |
|           | KEATHLEY        | DWELLING OTHER |        |           |            |
| KYG401529 | RESIDENCE       | THAN APARTMENT | 35892  | 37.590555 | -82.723888 |
|           | KESTER          | DWELLING OTHER |        |           |            |
| KYG400915 | RESIDENCE       | THAN APARTMENT | 1243   | 37.454444 | -82.814166 |
|           |                 | DWELLING OTHER |        |           |            |
| KYG401730 | KIDD RESIDENCE  | THAN APARTMENT | 50950  | 37.494722 | -82.880000 |
|           | LAFERTY         | DWELLING OTHER |        |           |            |
| KYG401638 | RESIDENCE       | THAN APARTMENT | 47022  | 37.558333 | -82.758888 |
|           | LAWSON          | DWELLING OTHER |        |           |            |
| KYG400593 | RESIDENCE       | THAN APARTMENT | 1248   | 37.549444 | -82.720000 |
|           | LAWSON          | DWELLING OTHER |        |           |            |
| KYG401271 | RESIDENCE       | THAN APARTMENT | 15635  | 37.453055 | -82.746944 |
|           | LITTLE          | DWELLING OTHER |        |           |            |
| KYG401851 | RESIDENCE       | THAN APARTMENT | 75141  | 37.533611 | -82.752777 |
|           | LITTLE          | DWELLING OTHER |        |           |            |
| KYG402117 | RESIDENCE       | THAN APARTMENT | 103052 | 37.453333 | -82.732777 |
|           |                 | DWELLING OTHER |        |           |            |
| KYG401654 | YORK RESIDENCE  | THAN APARTMENT | 49354  | 37.419389 | -82.727417 |
|           | MARTIN          | DWELLING OTHER |        |           |            |
| KYG401970 | RESIDENCE       | THAN APARTMENT | 81193  | 37.450277 | -82.723611 |
|           |                 | DWELLING OTHER |        |           |            |
| KYG401073 | MAY RESIDENCE   | THAN APARTMENT | 4327   | 37.531666 | -82.799166 |
|           | MCKINNEY        | DWELLING OTHER |        |           |            |
| KYG400612 | RESIDENCE       | THAN APARTMENT | 1265   | 37.569166 | -82.748611 |
|           | MCKINNEY        | DWELLING OTHER |        |           |            |
| KYG401541 | RESIDENCE       | THAN APARTMENT | 36057  | 37.600833 | -82.724166 |
|           | MEADE           | DWELLING OTHER |        |           |            |
| KYG400970 | RESIDENCE       | THAN APARTMENT | 1266   | 37.372777 | -82.675555 |
|           | MCKINNEY        | DWELLING OTHER |        |           |            |
| KYG401764 | RESIDENCE       | THAN APARTMENT | 53921  | 37.571194 | -82.732083 |
|           | MITCHELL        | DWELLING OTHER |        |           |            |
| KYG400478 | RESIDENCE       | THAN APARTMENT | 1269   | 37.448611 | -82.703055 |
|           | MITCHELL        | DWELLING OTHER |        |           |            |
| KYG400666 | RESIDENCE       | THAN APARTMENT | 1270   | 37.527222 | -82.828055 |
|           | MOORE           | DWELLING OTHER |        |           |            |
| KYG401533 | RESIDENCE       | THAN APARTMENT | 35887  | 37.430000 | -82.710555 |

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| KPDES#       | Name                 | Туре                          | AI#     | Latitude   | Longitude   |
|--------------|----------------------|-------------------------------|---------|------------|-------------|
|              | MULLINS II           | DWELLING OTHER                |         |            |             |
| KYG401442    | RESIDENCE            | THAN APARTMENT                | 74062   | 37.392500  | -82.739444  |
|              | MULLINS              | DWELLING OTHER                |         |            |             |
| KYG400714    | RESIDENCE            | THAN APARTMENT                | 1274    | 37.427777  | -82.743888  |
|              | MULLINS              | DWELLING OTHER                |         |            |             |
| KYG400975    | RESIDENCE            | THAN APARTMENT                | 1276    | 37.491666  | -82.785277  |
|              | NEWMAN               | DWELLING OTHER                |         |            |             |
| KYG401809    | RESIDENCE            | THAN APARTMENT                | 71436   | 37.446944  | -82.706111  |
|              |                      | DWELLING OTHER                |         |            |             |
| KYG401772    | ISON RESIDENCE       | THAN APARTMENT                | 54879   | 37.547778  | -82.762500  |
|              | PERKINS              | DWELLING OTHER                |         |            |             |
| KYG400836    | RESIDENCE            | THAN APARTMENT                | 1293    | 37.425555  | -82.810000  |
|              | PRATER               | DWELLING OTHER                |         |            |             |
| KYG401548    | RESIDENCE            | THAN APARTMENT                | 43224   | 37.517222  | -82.847777  |
|              |                      | DWELLING OTHER                |         |            |             |
| KYG401126    | ROSE RESIDENCE       | THAN APARTMENT                | 4342    | 37.561944  | -82.724166  |
|              |                      | DWELLING OTHER                |         |            |             |
| KYG400339    | ROWE RESIDENCE       | THAN APARTMENT                | 1304    | 37.566666  | -82.732500  |
|              | PRATER               | DWELLING OTHER                |         |            |             |
| KYG402063    | RESIDENCE            | THAN APARTMENT                | 97291   | 37.527494  | -82.842581  |
|              | SCARBERRY            | DWELLING OTHER                | 0.4.550 |            |             |
| KYG401981    | RESIDENCE            | THAN APARTMENT                | 81570   | 37.563611  | -82.801944  |
|              | SCOTT                | DWELLING OTHER                |         |            |             |
| KYG401721    | RESIDENCE            | THAN APARTMENT                | 50627   | 37.497777  | -82.782777  |
|              | SHEPHERD             | DWELLING OTHER                |         |            |             |
| KYG400844    | RESIDENCE            | THAN APARTMENT                | 1314    | 37.509166  | -82.875555  |
| WW.C.401010  | SHEPPARD             | DWELLING OTHER                | 10050   | 25.526044  | 00.000055   |
| KYG401218    | RESIDENCE            | THAN APARTMENT                | 12253   | 37.526944  | -82.828055  |
| WW.C.400.655 | SHREWBERRY           | DWELLING OTHER                | 1015    | 25.504444  | 00 51 61 11 |
| KYG400677    | RESIDENCE            | THAN APARTMENT                | 1315    | 37.504444  | -82.716111  |
| 1/1/0/400/01 | STUMBO               | DWELLING OTHER                | 1227    | 27 440444  | 00.714444   |
| KYG400601    | RESIDENCE            | THAN APARTMENT                | 1327    | 37.449444  | -82.714444  |
| 1/3//0401400 | STUMBO               | DWELLING OTHER                | 74005   | 27 420222  | 02.756666   |
| KYG401409    | RESIDENCE            | THAN APARTMENT                | 74025   | 37.438333  | -82.756666  |
| IZVC 40002 ( | STURGILL             | DWELLING OTHER                | 1220    | 27.560277  | 02.726666   |
| KYG400936    | RESIDENCE            | THAN APARTMENT                | 1328    | 37.560277  | -82.726666  |
| VVC401142    | TACKETT              | DWELLING OTHER                | 4222    | 27 475277  | 92 755277   |
| KYG401142    | RESIDENCE            | THAN APARTMENT                | 4332    | 37.475277  | -82.755277  |
| VVC401470    | TACKETT              | DWELLING OTHER                | 7/101   | 27 210444  | 92 609222   |
| KYG401470    | RESIDENCE            | THAN APARTMENT                | 74181   | 37.319444  | -82.698333  |
| VVC400779    | TURNER               | DWELLING OTHER                | 1242    | 27 5/10/11 | 92 762222   |
| KYG400778    | RESIDENCE<br>WALLACE | THAN APARTMENT DWELLING OTHER | 1343    | 37.548611  | -82.763333  |
| KYG401540    | RESIDENCE            | THAN APARTMENT                | 43120   | 37.492500  | -82.836944  |
| K1U401340    | RESIDENCE            |                               | 43120   | 37.494300  | -04.030944  |
| KYG401296    | WEBB RESIDENCE       | DWELLING OTHER THAN APARTMENT | 15655   | 37.474444  | -82.845000  |
| K1U401290    | WILLIAMSON           | DWELLING OTHER                | 13033   | 31.41444   | -02.043000  |
| KYG401353    | RESIDENCE            | THAN APARTMENT                | 33378   | 37 540277  | Q2 Q16200   |
| K1U4U1333    | RESIDENCE            | I HAN AFAKIMENI               | 333/8   | 37.540277  | -82.816388  |

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Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

| KPDES#         | Name            | Туре           | AI#     | Latitude    | Longitude  |
|----------------|-----------------|----------------|---------|-------------|------------|
|                | WILLIAMSON      | DWELLING OTHER |         |             | 9          |
| KYG401406      | RESIDENCE       | THAN APARTMENT | 74022   | 37.476111   | -82.744444 |
|                | WILLIAMSON      | DWELLING OTHER |         |             |            |
| KYG401601      | RESIDENCE       | THAN APARTMENT | 46144   | 37.502777   | -82.724166 |
|                | WRIGHT          | DWELLING OTHER |         |             |            |
| KYG400579      | RESIDENCE       | THAN APARTMENT | 1367    | 37.543888   | -82.751944 |
|                |                 | DWELLING OTHER |         |             |            |
| KYG401645      | DUFF RESIDENCE  | THAN APARTMENT | 48864   | 37.456222   | -82.750000 |
|                | YOUMANS         | DWELLING OTHER |         |             |            |
| KYG400724      | RESIDENCE       | THAN APARTMENT | 1369    | 37.469444   | -82.763888 |
|                |                 | DWELLING OTHER |         |             |            |
| KYG401868      | ROWE RESIDENCE  | THAN APARTMENT | 75746   | 37.582494   | -82.792359 |
|                | ALLEN           | DWELLING OTHER |         |             |            |
| KYG401883      | RESIDENCE       | THAN APARTMENT | 76185   | 37.562778   | -82.732476 |
|                | HOWARD          | DWELLING OTHER |         |             |            |
| KYG401857      | RESIDENCE       | THAN APARTMENT | 75556   | 37.537221   | -82.849438 |
|                | BILITER         | DWELLING OTHER |         |             |            |
| KYG401876      | RESIDENCE       | THAN APARTMENT | 76078   | 37.543383   | -82.864965 |
|                |                 | MOBILE HOME    |         |             |            |
| KY0103233      | S & V MHP       | SITES          | 1305    | 37.473055   | -82.752777 |
|                | LEFT BEAVER     |                |         |             |            |
|                | CREEK           | APARTMENT      |         |             |            |
| KY0096342      | TOWNHOUSES      | BUILDINGS      | 1255    | 37.466944   | -82.755277 |
|                |                 |                |         |             |            |
|                | WARCO HOUSING   | APARTMENT      |         |             |            |
| KY0072974      | PROJECT         | BUILDINGS      | 1352    | 37.550277   | -82.773888 |
|                |                 |                |         |             |            |
|                | KNOTT CO WATER  | SEWERAGE       | 1       |             |            |
| KY0042854      | & SEWER DIST    | SYSTEMS        | 2527    | 37.351388   | -82.859166 |
| ************** | A CAR TO LICEN  | SEWERAGE       | 10.60   | 25.500.55.5 | 00 551011  |
| KY0026921      | MARTIN STP      | SYSTEMS        | 1262    | 37.580555   | -82.751944 |
| *******        | WILLIAM AND GED | SEWERAGE       | 2.55.61 | 25.440055   | 00.01.6111 |
| KY0105228      | WAYLAND STP     | SYSTEMS        | 35761   | 37.448055   | -82.816111 |
| 1/1/00/20/200  | WHEELWRIGHT     | SEWERAGE       | 40.53.4 | 27.240000   | 00.717500  |
| KY0028789      | STP             | SYSTEMS        | 40534   | 37.348888   | -82.717500 |
| 17370107051    | EACTEDNICTE     | SEWERAGE       | 25260   | 27.517010   | 02.000610  |
| KY0107051      | EASTERN STP     | SYSTEMS        | 35260   | 37.517819   | -82.809619 |
|                | MCDOWELL        |                |         |             |            |
| 1/3/0005701    | APPALACHIAN     | HOGDITAL       | 1124    | 27 450055   | 02.740000  |
| KY0085791      | REG HOSP        | HOSPITAL       | 1134    | 37.458055   | -82.748888 |

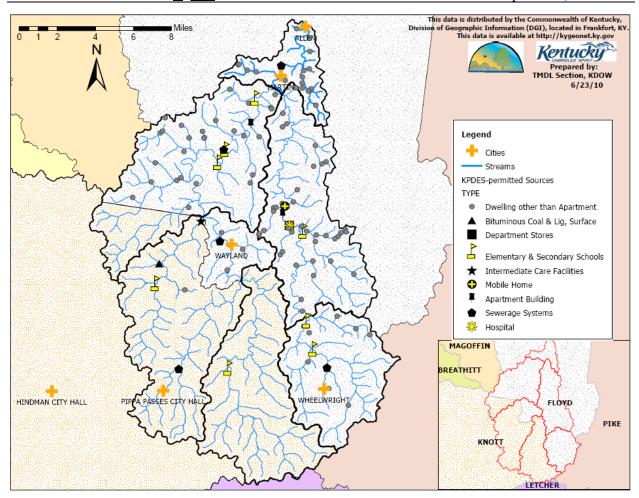


Figure 5.1 KPDES-permitted Sources of  $\underline{E}$ .  $\underline{coli}$  (or Fecal Coliform) in the Beaver Creek Watershed

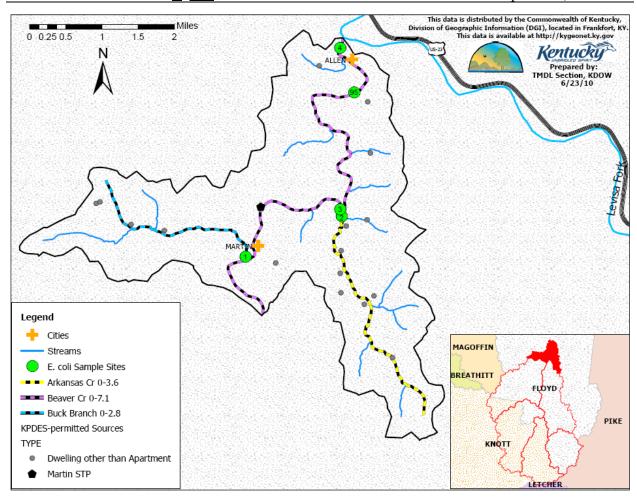


Figure 5.2 KPDES-permitted Sources of  $\underline{E}$ .  $\underline{coli}$  (or Fecal Coliform) in the Mainstem Beaver Creek Subwatershed

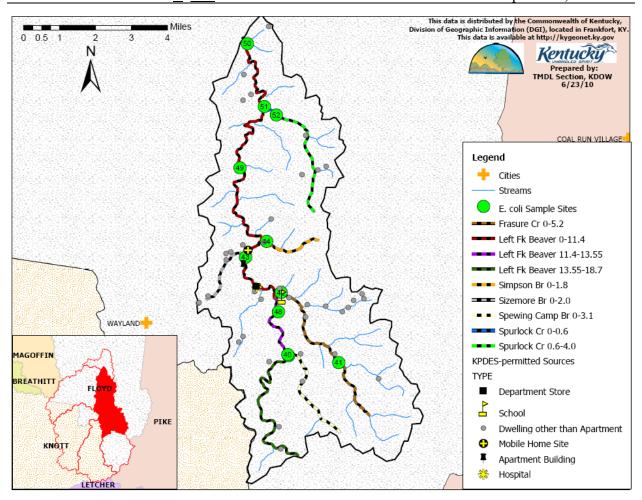


Figure 5.3 KPDES-permitted Sources of  $\underline{E}$ .  $\underline{coli}$  (or Fecal Coliform) in the Lower Left Fork Beaver Creek Subwatershed

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 47 is under site 40.

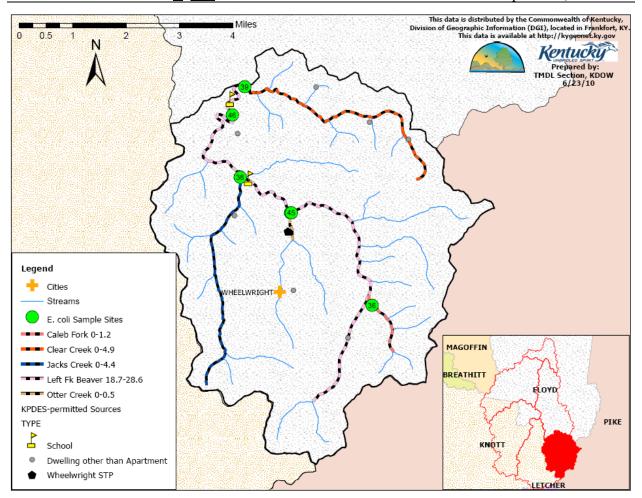


Figure 5.4 KPDES-permitted Sources of  $\underline{E}$ .  $\underline{coli}$  (or Fecal Coliform) in the Upper Left Fork Beaver Creek Subwatershed

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 37 is under site 45.

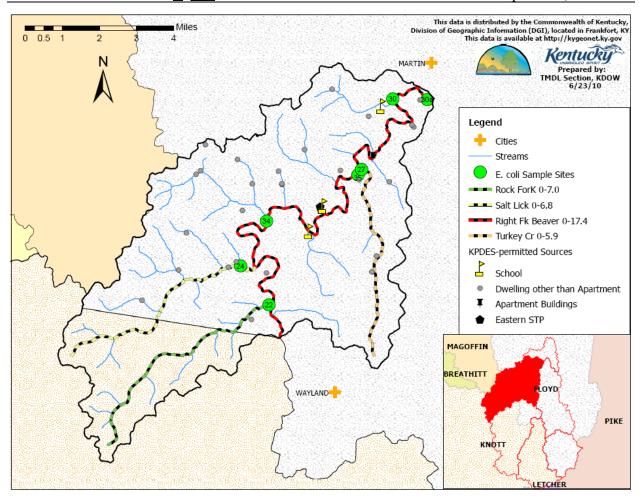


Figure 5.5 KPDES-permitted Sources of  $\underline{E}$ .  $\underline{coli}$  (or Fecal Coliform) in the Lower Right Fork Beaver Creek Subwatershed

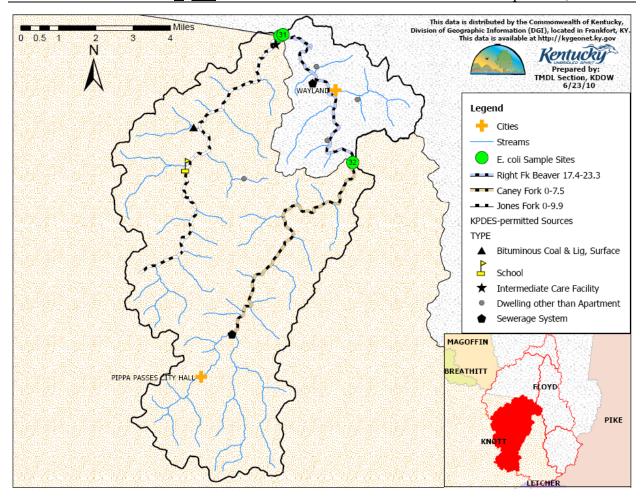


Figure 5.6 KPDES-permitted Sources of  $\underline{E}$ .  $\underline{coli}$  (or Fecal Coliform) in the Middle Right Fork Beaver Creek Subwatershed

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 20 is under site 31.

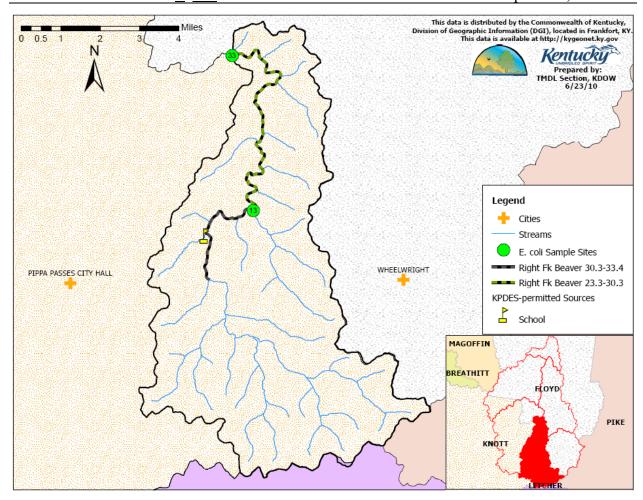


Figure 5.7 KPDES-permitted Sources of <u>E</u>. <u>coli</u> (or Fecal Coliform) in the Upper Right Fork Beaver Creek Subwatershed

#### 5.1.1.1 Sewerage Systems in Beaver Creek

Kentucky regulation 401 KAR 5:006 specifies wastewater-planning requirements for regional areas. Municipal wastewater treatment facilities are required to prepare 20-year regional planning documents under certain conditions as described in regulation. Section 2 of this regulation specifies that:

"(1) No new regional facility shall be constructed, no average daily design capacity of an existing regional facility shall be expanded by more than thirty (30) percent, or no existing regional sewage collection system shall expand its equivalent population served by more than thirty (30) percent of the existing population, without the regional planning agency submitting a regional facility plan and the cabinet approving the plan. All regional facility plans shall be prepared by a registered professional engineer."

And that:

- "(2) A regional planning agency shall submit a regional facility plan or regional facility plan update when the following occurs:
  - (a) A new regional facility is proposed to be constructed within the planning area;
  - (b) The average daily design capacity of an existing regional facility is proposed to be expanded by more than thirty (30) percent;
  - (c) The equivalent population served by an existing regional sewage collection system is proposed to be expanded by more than thirty (30) percent of the existing population served;
  - (d) A regional facility or other governmental agency applies for a grant from the U.S. EPA or applies for a loan from the federally assisted wastewater revolving fund pursuant to the requirements of 40 CFR Part 35 and 200 KAR Chapter 17. A plan of study shall be submitted to the cabinet for the project to be eligible to be placed on the project priority list and receive priority points;
  - (e) A regional planning agency considers the submission of the plan to be in the best interest of the public and the environment; or
  - (f) It has been twenty (20) years since the regional planning agency or its successor has submitted a regional facility plan."

Additionally, Section 4 of 401 KAR 5:005 requires that construction permits only be issued for wastewater treatment and conveyance facilities if the construction is compatible with the facilities plan.

"Section 4. Application; Preliminary Considerations. (1) A permit shall not be granted to a facility that is not compatible with a regional facility plan or with a water quality management plan approved by the cabinet or the U.S. EPA."

There are three wastewater-planning areas in the Beaver Creek watershed, South Floyd, Prestonsburg, and the Knott County Water & Sewer District (of which the Caney Creek Water District is in Beaver Creek watershed) as shown in Figure 5.8. The South Floyd Planning Area covers almost the entire Beaver Creek watershed that is in Floyd County. The Prestonsburg Planning Area covers a small fraction of Beaver Creek around the city of Allen as shown in Figure 5.9. The Caney Creek Waster District serves a small area in the headwaters of Caney Creek as shown in Figure 5.10.

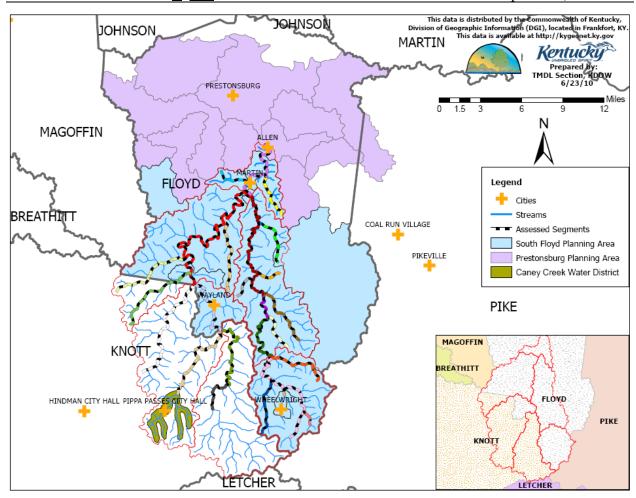


Figure 5.8 Wastewater Planning Areas in the Beaver Creek Watershed

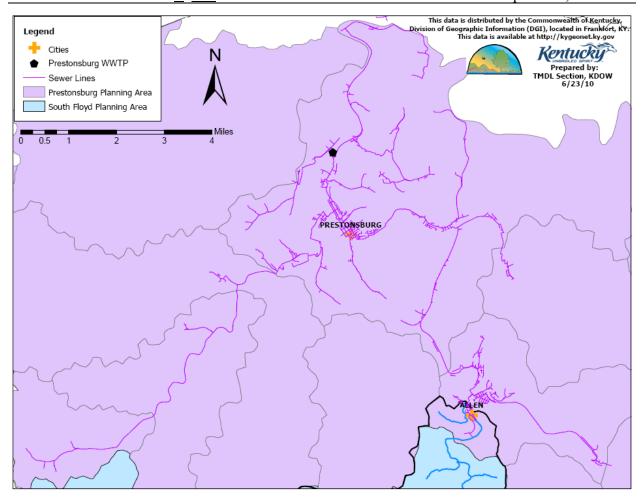


Figure 5.9 Detail of the Prestonsburg Planning Area and Sewer Lines

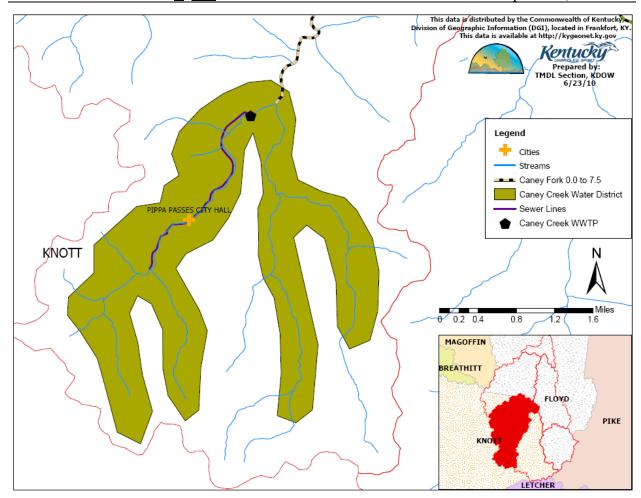


Figure 5.10 Detail of the Caney Creek Water District and Sewer Lines

Information about permitted sources was obtained from the application for permit submitted by the permitted entity and from the KPDES-permit. DMR information was obtained from The EPA Permit Compliance System database (US EPA, 2010) and the TEMPO database maintained by the Department for Environmental Protection.

# Eastern Waste Water Treatment Plant (WWTP) KPDES permit # KY0107051 (effective 6/1/08-5/31/13)

The Eastern treatment plant is a 0.025 million gallons per day (MGD) plant owned and operated by the Southern Water and Sewer District. It is located in the Lower Right Fork Beaver Creek subwatershed and the effluent is discharged at river mile (RM) 8.4 of Right Fork Beaver Creek. It serves 42 residential units and came on-line during June 2008. The treatment process consists of influent screens, surge tanks for flow equalization, extended aeration, clarifiers, and chlorine disinfection. Waste sludge is placed in holding tanks and is disposed of by a sanitary service company at a publicly owned treatment works. KPDES permit limits for this discharge are: <u>E</u>. <u>coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. A review of Discharge Monitoring Reports (DMRs, see Appendix C for DMR data from all major KPDES-permitted sources) from June 2008 through December 2009 indicate 5 months with exceedances of permit limits for <u>E</u>. <u>coli</u>.

# Knott County Water and Sewer District Caney Creek WWTP KPDES permit # KY0042854 (effective 7/1/07-6/30/12)

The Knott County Caney Creek WWTP is a 0.10 MGD plant owned by the Knott County Water and Sewer District. It is located in the Middle Right Fork Beaver Creek subwatershed and the effluent is discharged at RM 7.8 of Caney Creek. It has about 130 sewer connections and serves about 612 people on Alice Lloyd College and about 390 residents in and around Pippa Passes. The treatment process consists of screening, grit removal, aeration, clarification, chlorine disinfection and dechlorination. Waste sludge is processed by drying beds and is disposed of in a landfill. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. A review of DMRs from August 2007 through November 2009 indicates 10 months with exceedances of permit limits for <u>E. coli</u>. Prior to August 07, this facility reported fecal coliform and one month exceeded permit limits from Jan 2007 through July 2007.

## Martin Sewerage Treatment Plant KPDES permit # KY0026921 (effective 12/1/05-11/30/10)

The Martin Sewerage Treatment Plant (STP) is a 0.12 MGD plant owned by the city of Martin. It is located in the Mainstem Beaver Creek subwatershed and the effluent is discharged to RM 5.2 of Beaver Creek. It serves approximately 1,100 residents and is the regional facility for the area around Martin. The treatment process consists of a grinder and grit channel at the influent, an equalization basin with an oxidation ditch and clarifier combination with ultra-violet disinfection and post aeration. Sludge is pumped from a holding tank to drying beds. The dried sludge is composted or is hauled to a landfill. KPDES permit limits for this discharge are: Fecal coliform effluent gross limit of 200 colonies/100 ml as a monthly average and 400 colonies/100 ml as a maximum weekly average. A review of DMRs from August 2007 through November 2009 indicate 10 months with exceedances of permit limits for Fecal coliform; however, no exceedances have been reported since June 2008.

# Wayland Sewerage Treatment Plant KPDES permit # KY0105228 (effective 12/1/2008-11/30/13)

The Wayland plant is a 0.1 MGD plant owned and operated by the Southern Water and Sewer District. It is located in the Middle Right Fork Beaver Creek subwatershed and the effluent is discharged at RM 19.8 of Right Fork Beaver Creek. It serves a population of 512 in and around Wayland. The wastewater treatment process for this facility consists of screening, extended aeration, activated sludge, settling, micro screening, chlorine disinfection and post aeration. Sludge is pumped from a holding tank to a belt filter press and is hauled to a landfill. KPDES permit limits for this discharge are: <u>E</u>. <u>coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. A review of DMRs from December 2008 through July 2009 indicates 3 months with exceedances of permit limits for <u>E</u>. <u>coli</u>. Prior to December 2008, this facility reported fecal coliform and 2 months showed exceedances of permit limits from Jan 2007 through November 2008.

# Wheelwright Sewerage Treatment Plant KPDES permit # KY0028789 (effective 7/1/07-6/30/12)

The Wheelwright plant is a 0.225 MGD plant owned and operated by Wheelwright Utilities. It is located in the Upper Left Fork Beaver Creek subwatershed and the effluent is discharged at RM 0.35 of Otter Creek. It serves a total population of 217 in and around Wheelwright (171 residents), Upper Burton (11 residents) and Lower Burton (35 residents). The wastewater treatment process for this facility consists of an extended aeration plant with chlorine disinfection and dechlorination. Sludge is processed by drying beds and is hauled to a landfill. KPDES permit limits for this discharge are: <u>E</u>. <u>coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. A review of DMRs from July 2007 through December 2009 indicates 4 months with exceedances of permit limits for <u>E</u>. <u>coli</u>. Prior to July 2007, this facility reported fecal coliform and 1 month showed an exceedance of permit limits from Jan 2007 through June 2007.

#### Prestonsburg WWTP and Landfarm KPDES Permit # KY0027413 (effective 3/1/10-2/28/15)

The Prestonsburg plant is a 1 MGD facility owned and operated by the Prestonsburg City's Utilities Commission. It is located outside of the Beaver Creek Watershed and the effluent is discharged at RM 53.2 of Levisa Fork. It serves a population of 7,523 in the city of Prestonsburg and the surrounding area including the Allen area, which is within the Beaver Creek Mainstem subwatershed. Sewer lines extend from Allen to the Prestonsburg WWTP and the Prestonsburg City's Utilities Commission is responsible for these lines (See Section 5.1.1.2 Illegal WLA Sources, below). The wastewater treatment process consists of screening, grit removal, primary settling, conventional activated sludge, secondary settling, chlorine disinfection, and dechlorination. Sludge is processed by aerobic digestion, belt filter press, and drying beds, then is hauled to a landfill for disposal. The treated effluent is occasionally used for irrigation of a golf course and for wash-down water in the treatment plant. KPDES permit limits for this discharge are: E. coli effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is under a consent judgment to demonstrate efforts to control and eventually eliminate two combined sewer overflows (neither of which are in the Beaver Creek Watershed).

## **5.1.1.2 Illegal WLA Sources**

Illegal WLA sources, by definition, are not allowed in the watershed, and receive an allocation of zero in the TMDL process. Illegal sources related to KPDES-permitted human waste disposal include leaking sewer lines and sanitary sewer overflows. Leaking sewer lines and sanitary sewer overflows are the responsibility of the permitted owner of the sewerage system, thus in addition to their outfall effluent, the sewerage systems noted above are responsible for discharges from sewer lines under their control. Although the Prestonsburg WWTP is not in the Beaver Creek Watershed, the sewer lines that extend to Allen are in the Beaver Creek Watershed and are permitted under the Prestonsburg permit. Leaking sewer lines and sanitary sewer overflows are illegal sources of <u>E</u>. <u>coli</u> (or fecal coliform) and thus a waste load of 0 colonies/day is assigned to these sources.

Note this Section of the TMDL is not intended to summarize the universe of potential illegal KPDES-permitted sources that may discharge pollutants into surface waters, nor does it attempt to summarize the universe of KPDES-permitted sources that may be operating illegally (e.g., outside of permit limits or conditions, etc.). Instead, it defines the illegal permitted sources that could be present in the watershed.

# 5.1.1.3 Package Treatment Plants in Beaver Creek Watershed

## Allen Central High School KPDES permit # KY0079430 (effective 3/1/07-2/28/12)

Allen Central High School has a 0.011 MGD package treatment plant, which is treated by extended aeration with disinfection. The treated effluent is discharged to RM 8.3 of Right Fork Beaver Creek. It is located next to the Eastern STP and is required to eliminate its discharge and connect to a comprehensive sewer system when it comes available and can adequately treat the wastes. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit DMRs on a quarterly basis and a review of DMRs from the quarters ending March 2007 through September 2009 indicate 5 quarters with exceedances of permit limits for <u>E. coli</u>.

#### Beaver Creek Elementary School KPDES permit # KY0077542 (effective 5/1/07-4/30/12)

Beaver Creek Elementary School has a 0.007 MGD package plant with its discharge treated by screening, primary settling, activated sludge, secondary settling, and chlorine disinfection followed by disinfection. Effluent is discharged at RM 0.05 of Hall Branch. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit DMRs on a quarterly basis and a review of DMRs from the quarters ending June 2007 through December 2009 indicate no exceedances of permit limits for E. coli.

#### James A Duff Elementary School KPDES permit #KY0093017 (effective 3/1/07-2/28/12)

James A Duff Elementary School has 0.008 MGD package plant with its discharge treated by extended aeration with disinfection. The effluent is discharged at RM 9.3 of the Right Fork Beaver Creek. This discharge is required to be eliminated by connection to a comprehensive sewer system when it becomes available and can adequately treat wastes. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit DMRs on a quarterly basis and a review of DMRs from quarters ending June 2007 through September 2009 indicate no exceedances of permit limits for <u>E. coli</u>.

#### Jones Fork Elementary School KPDES permit # KY0087076 (effective 5/1/07-4/30/12)

Jones Fork Elementary School has a 0.006 MGD package plant with its discharge treated by screening, grit removal, primary settling, activated sludge, secondary settling, and chlorine disinfection followed by dechlorination. Its effluent is discharged at RM 5.55 of Jones Fork.

KPDES permit limits for this discharge are:  $\underline{E}$ .  $\underline{coli}$  effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit DMRs on a quarterly basis and a review of DMRs from quarters ending June 2007 through December 2009 indicate one quarter with an exceedance of permit limits for  $\underline{E}$ . coli.

## May Valley Elementary School KPDES permit # KY0106755 (effective 3/1/07-2/28/12)

May Valley Elementary School has a 0.006 MGD package plant with extended aeration and disinfection. Its effluent is discharged at RM 0.3 of Stephens Branch. This discharge is required to be eliminated by connection to a comprehensive sewer system when it becomes available and can adequately treat wastes. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit DMRs on a quarterly basis and a review of DMRs from quarters ending June 2007 through September 2009 indicate two quarters with an exceedance of permit limits for <u>E. coli</u>.

# McDowell Elementary School KPDES #KY0079421 (effective 3/1/07-2/28/12)

McDowell Elementary School has a 0.015 MGD package plant with extended aeration and disinfection. Its effluent is discharged at RM 0.4 of Frasure Creek. This discharge is required to be eliminated by connection to a comprehensive sewer system when it becomes available and can adequately treat wastes. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit DMRs on a monthly basis and a review of DMRs from March 2007 through September 2009 indicate one month with an exceedance of permit limits for <u>E. coli</u>.

## Osborne Elementary School KPDES permit #KY0089435 (effective 3/1/07-2/28/12)

Osborne Elementary School has a 0.0068 MGD package plant with extended aeration and disinfection. Its effluent is discharged to RM 0.1 of Riley Branch. This discharge is required to be eliminated by connection to a comprehensive sewer system when it becomes available and can adequately treat wastes. KPDES permit limits for this discharge are: <u>E</u>. <u>coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit DMRs on a quarterly basis and a review of DMRs from quarters ending June 2007 through September 2009 indicate no exceedances of permit limits for <u>E</u>. <u>coli</u>.

# South Floyd High School KPDES permit # KY0093912 (effective 3/1/07-2/28/12)

South Floyd High School has a 0.015 MGD package plant with extended aeration and disinfection. Its effluent is discharged at RM 19.3 of Left Fork Beaver Creek. This discharge is required to be eliminated by connection to a comprehensive sewer system when it becomes available and can adequately treat wastes. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a

maximum weekly average. This facility is required to submit DMRs on a monthly basis and a review of DMRs from March 2007 through September 2009 indicate eight months with exceedances of permit limits for <u>E</u>. <u>coli</u>.

# S & V Mobile Home Park KPDES permit # KY0103233 (effective 4/1/07-6/30/12)

S & V Mobile Home Park has a 0.0099 MGD package plant with extended aeration and disinfection. Its effluent is discharged at RM 9.1 of Left Fork Beaver Creek. This discharge is required to be eliminated by connection to a comprehensive sewer system when it becomes available and can adequately treat wastes. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit DMRs on a quarterly basis and a review of DMRs from quarters ending September 2007 through December 2009 indicate two quarters with exceedances of permit limits for E. coli.

## Left Fork Beaver Creek Townhouses KPDES permit # KY0096342 (effective 2/1/07-1/31/12)

Left Fork Beaver Creek Townhouses has a 0.018 MGD package plant with activated sludge, chlorine disinfection and dechlorination. Its effluent is discharged at RM 9.6 of Left Fork Beaver Creek. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit monthly DMRs and a review of DMRs from February 2007 through September 2009 indicate ten months with exceedances of permit limits for <u>E. coli</u>.

# Warco Housing Project KPDES permit # KY0072974 (effective 1/1/07-12/31/11)

Warco Housing Project has a 0.025 MGD package plant with extended aeration and disinfection. Its effluent is discharged to RM 4.15 of Right Fork Beaver Creek. This discharge is required to be eliminated by connection to a comprehensive sewer system when it becomes available and can adequately treat wastes. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit monthly DMRs and a review of DMRs from January 2007 through September 2009 indicate five months with exceedances of permit limits for E. coli.

# McDowell Appalachian Regional Hospital KPDES permit # KY0085791 (effective 3/1/07-2/28/12)

McDowell Appalachian Regional Hospital has a 0.02 MGD package plant with extended aeration and disinfection. Its effluent is discharged at RM 10.45 of the Left Fork Beaver Creek. This discharge is required to be eliminated by connection to a comprehensive sewer system when it becomes available and can adequately treat wastes. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit monthly DMRs and a review of DMRs from January 2007 through September 2009 indicate one month with an exceedance of permit limits for <u>E. coli</u>.

# Consol of KY Inc-Jones Fork KPDES permit # KY0094510 (effective 5/1/06-11/30/06)

Consol of KY Inc-Jones Fork has a package treatment plant to treat bathhouse effluent with extended aeration. This treated effluent discharges to the coal preparation plant's static thickener and the underflow from this is discharged to a slurry impoundment permitted under KYG043632. The slurry impoundment discharges to RM 0.65 of Fourmile Branch. KPDES permit limits for this discharge are: Fecal coliform effluent gross limit of 200 colonies/100 ml as a monthly average and 400 colonies/100 ml as a maximum weekly average. This facility is required to submit monthly DMRs for fecal coliform and a review of DMRs from January 2007 through September 2009 indicate no exceedances of permit limits for fecal coliform.

# McDowell General Store KPDES permit # KY0103136 (effective 12/1/07-11/30/12)

The McDowell General Store has a 0.0005 MGD package plant with aeration, sand filtration and chlorine treatment. Its effluent is discharged at RM 10.45 of Left Fork Beaver Creek. This discharge is required to be eliminated by connection to a comprehensive sewer system when it becomes available and can adequately treat wastes. KPDES permit limits for this discharge are: E. coli effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit quarterly DMRs and a review of DMRs indicate that "no discharge" has been evident to collect samples.

#### Golden Years Rest Home KPDES permit # KY0083089 (effective 4/1/07-3/31/12)

Golden Years Rest Home has a 0.01 MGD package plant with extended aeration and disinfection. Its effluent is discharged at RM 0.3 of Jones Fork. This discharge is required to be eliminated by connection to a comprehensive sewer system when it becomes available and can adequately treat wastes. KPDES permit limits for this discharge are: <u>E. coli</u> effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average. This facility is required to submit monthly DMRs and a review of DMRs from April 2007 through September 2009 indicate four months with exceedances of permit limits for <u>E. coli</u>.

#### 5.1.1.4 Home Units in Beaver Creek Watershed

There are 92 known home units in the Beaver Creek Watershed, each with a permitted design capacity of 0.0005 MGD. Home units are indicated on maps and in tables as "dwelling other than apartment". Home units are wastewater treatment systems designed for an individual home. Although there are many options for a home unit, the minimum requirements are extended aeration, sand filtration, and disinfection. KPDES permit limits for these discharges are: E. coli effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average or Fecal coliform effluent gross limit of 200 colonies/100 ml as a monthly average and 400 colonies/100 ml as a maximum weekly average. These discharges are required to be eliminated by connection to a comprehensive sewer system when it becomes available and can adequately treat wastes. A spot check of DMRs for home units indicated that they frequently do not discharge (no flow box is checked on the DMRs). A spot check of inspection reports for this type of source indicated issues such as chlorination tablets not in contact with the sanitary wastewater. A compliance report run on home units across KY indicated only a 3 % compliance rate with permit requirements (personal

communication Larry Sowder, 2010). Due to issues with home units, KDOW currently requires that all other options be eliminated before approving any permits for new home units (KDOW, 2010c).

#### 5.1.2 Future Growth WLA

The Future Growth WLA is a portion of the allowable load that is set aside for expansion of existing KPDES-permitted sources or new KPDES-permitted sources in the watershed. This could include new or expanded sewerage treatment plants, new package plants, or possibly new home units. This is not a required element in TMDLs, but is optional. Reserving a future growth WLA component in a TMDL allows growth to occur in the watershed without needing to re-open the TMDL to allocate waste loads to these new or expanded sources. Any new discharges of <u>E</u>. <u>coli</u> in the watershed must meet permit limits based on the Water Quality Standards in 401 KAR 10:031, and must not cause or contribute to an existing impairment.

Because of the sheer volume of permits for Home Units, it is possible that a permit has been missed; however this TMDL still applies to all sources of  $\underline{E}$ .  $\underline{coli}$  (or fecal coliform) regardless of whether or not they are indicated in the TMDL tables. Any KPDES-permitted source of sanitary wastewater not identified in this document will receive a TMDL load from the future growth WLA.

#### 5.1.3 KPDES MS4 Storm Water

401 KAR 5:002(91) adopts the definition of Municipal Separate Storm Sewer Systems (MS4s) contained in 40 C.F.R. 122.26(b)(8) as:

"a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

- i. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
- ii. Designed or used for collecting or conveying storm water;
- iii. Which is not a combined sewer; and
- iv. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2."

EPA has categorized MS4s into three categories: small, medium, and large. The medium and large categories are regulated under the Phase I Storm Water program. Large systems, such as the cities of Lexington and Louisville, have populations in excess of 250,000. Medium systems have populations in excess of 100,000 but less than 250,000. However, there are currently no medium-sized systems in Kentucky. Phase I systems have five-year permitting cycles and have

annual reporting requirements, including monitoring. The small MS4 category includes all MS4s not covered under Phase I. Since this category covers a large number of systems, only a select group are regulated under the Phase II rule, either being automatically included based on population (i.e., having a total population over 10,000 or a population per square mile in excess of 1000) or on a case-by-case basis due to the potential to cause adverse impact on surface water(s). Water quality monitoring is not a requirement of Phase II MS4s, unless the waterbody has an approved TMDL and the MS4 causes or contributes to the impairment for which the TMDL was written. There are no MS4 Communities in the Beaver Creek Watershed; therefore, a waste load allocation to a MS4 does not apply.

#### **5.1.4 KPDES-Permitted CSOs**

Combined Sewer Overflows (CSOs) are discharges from combined sewers, (i.e., sewers that carry both sanitary and storm water flow in the same pipe). In accordance with U.S. EPA's Combined Sewer Overflow Control Policy (1994), KDOW has signed Consent Decrees or Consent Judgments with all CSO communities in Kentucky. Within each Consent Decree, Judgment Communities are required to submit a Long Term Control Plan (LTCP) as the blueprint by which CSOs must be remediated (e.g., through separation of combined sewers, treatment of their discharge, and/or reduction in frequency, duration or volume, etc.) until they meet the WQS. KDOW then approves or disapproves the LTCP. Individual CSOs are given outfall numbers under the community's KPDES permit. There are no combined sewers in the Beaver Creek watershed; therefore, a waste load allocation to permitted CSOs does not apply.

# **5.1.5 KPDES Animal Feeding Operations**

Animal feeding operations (AFOs) are defined by 401 KAR 5:002 Section 1(5) as:

- "a lot or facility, other than an aquatic animal production facility, that meets one (1) of the following descriptions:
  - (a)1. "Large animal feeding operation" as defined in subsection (71) of this section; or 2. "Medium animal feeding operation" as defined in subsection (83) of this section; and
  - *(b) If:*
- 1.a. Animals other than aquatic animals, have been, are, or will be stabled or confined and fed or maintained for a total of forty-five (45) days or more in a twelve (12) month period; and
- b. Crops, vegetation forage growth, or postharvest residues are not sustained in the normal growing season over any portion of the lot or facility."

Subsection 71 defines "large animal feeding operation" as:

- "an AFO that stables or confines as many as or more than the numbers of animals specified in any of the following categories:
  - (a) 700 mature dairy cows, whether milked or dry;
  - (b) 1,000 veal calves;

- (c) 1,000 cattle other than mature dairy cows or veal calves. Cattle includes heifers, steers, bulls, or cow or calf pairs;
- (d) 2,500 swine each weighing fifty-five (55) pounds or more;
- (e) 10,000 swine each weighing less than fifty-five (55) pounds;
- (f) 500 horses:
- (g) 10,000 sheep or lambs;
- (h) 55,000 turkeys;
- (i) 30,000 laying hens or broilers, if the AFO uses a liquid manure handling system;
- (j) 125,000 chickens other than laying hens, if the AFO uses other than a liquid manure handling system;
- (k) 30,000 ducks, if the AFO uses other than a liquid manure handling system; or
- (1) 5,000 ducks, if the AFO uses a liquid manure handling system."

# Subsection 83 defines "medium animal feeding operation" as:

- "an AFO that stables or confines the type and number of animals within any of the following ranges:
  - (a) 200 to 699 mature dairy cows, whether milked or dry;
  - (b) 300 to 999 veal calves;
  - (c) 300 to 999 cattle other than mature dairy cows or veal calves. Cattle includes heifers, steers, bulls, or cow or calf pairs;
  - (d) 750 to 2,499 swine each weighing fifty-five (55) pounds or more;
  - (e) 3,000 to 9,999 swine each weighing less than fifty-five (55) pounds;
  - (f) 150 to 499 horses;
  - (g) 3,000 to 9,999 sheep or lambs;
  - (h) 16.500 to 54.999 turkevs:
  - (i) 9,000 to 29,999 laying hens or broilers, if the AFO uses a liquid manure handling system;
  - (j) 37,500 to 124,999 chickens, other than laying hens, if the AFO uses other than a liquid manure handling system;
  - (k) 25,000 to 81,999 laying hens, if the AFO uses other than a liquid manure handling system;
  - (l) 10,000 to 29,999 ducks, if the AFO uses other than a liquid manure handling system; or
  - (m) 1,500 to 4,999 ducks if the AFO uses a liquid manure handling system."
- 401 KAR 5:002 further defines some AFOS as large, medium or small Confined Animal Feeding Operations (CAFOs) based upon definitions in 40 CFR 122.23:
- "An AFO is defined as a Large CAFO if it stables or confines as many as or more than the numbers of animals specified in any of the following categories:
  - (i) 700 mature dairy cows, whether milked or dry;
  - (ii) 1,000 veal calves;
  - (iii) 1,000 cattle other than mature dairy cows or veal calves. Cattle includes but is not limited to heifers, steers, bulls and cow/calf pairs;
  - (iv) 2,500 swine each weighing 55 pounds or more;

- (v) 10,000 swine each weighing less than 55 pounds;
- (vi) 500 horses;
- (vii) 10,000 sheep or lambs;
- (viii) 55,000 turkeys;
- (ix) 30,000 laying hens or broilers, if the AFO uses a liquid manure handling system;
- (x) 125,000 chickens (other than laying hens), if the AFO uses other than a liquid manure handling system;
- (xi) 82,000 laying hens, if the AFO uses other than a liquid manure handling system;
- (xii) 30,000 ducks (if the AFO uses other than a liquid manure handling system); or
- (xiii) 5,000 ducks (if the AFO uses a liquid manure handling system)."

## "An AFO is defined as a Medium CAFO if:

- (i) The type and number of animals that it stables or confines falls within any of the following ranges:
  - (A) 200 to 699 mature dairy cows, whether milked or dry;
  - (B) 300 to 999 veal calves;
  - (C) 300 to 999 cattle other than mature dairy cows or veal calves. Cattle includes but is not limited to heifers, steers, bulls and cow/calf pairs;
  - (D) 750 to 2,499 swine each weighing 55 pounds or more;
  - (E) 3,000 to 9,999 swine each weighing less than 55 pounds;
  - (F) 150 to 499 horses;
  - (G) 3,000 to 9,999 sheep or lambs;
  - (H) 16,500 to 54,999 turkeys;
  - (I) 9,000 to 29,999 laying hens or broilers, if the AFO uses a liquid manure handling system:
  - (J) 37,500 to 124,999 chickens (other than laying hens), if the AFO uses other than a liquid manure handling system;
  - (K) 25,000 to 81,999 laying hens, if the AFO uses other than a liquid manure handling system;
  - (L) 10,000 to 29,999 ducks (if the AFO uses other than a liquid manure handling system); or
- (M) 1,500 to 4,999 ducks (if the AFO uses a liquid manure handling system); and (ii) Either one of the following conditions are met:
  - (A) Pollutants are discharged into waters of the United States through a manmade ditch, flushing system, or other similar man-made device; or
  - (B) Pollutants are discharged directly into waters of the United States which originate outside of and pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation."

A small CAFO is defined as an "AFO that is designated as a CAFO and is not a Medium CAFO." A small CAFO may be designated if:

"it is a significant contributor of pollutants to waters of the United States" or "it has been determined that one or more pollutants in the AFO's discharge contributes to an impairment in a downstream or adjacent State or Indian country water that is impaired for that pollutant."

## Additional requirements are that:

"no AFO may be designated as a CAFO unless:

- (i) Pollutants are discharged into waters of the United States through a manmade ditch, flushing system, or other similar manmade device; or
- (ii) Pollutants are discharged directly into waters of the United States which originate outside of the facility and pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation.

401 KAR 5:060 allows an animal feeding operation to submit voluntary certification of nodischarge if there is no discharge from the AFO. AFOs that will or are anticipated to discharge to the waters of the Commonwealth are required to obtain a KPDES permit pursuant to 401 KAR 5:060, Section 10. "Discharge" means that *process wastewater* or water that comes into contact with the production area and discharges to the waters of the Commonwealth. Process wastewater means water directly or indirectly used in the operation of the AFO for any or all of the following: spillage or overflow from animal or poultry watering systems; washing, cleaning, or flushing pens, barns, manure pits, or other AFO facilities; direct contact swimming, washing, or spray cooling of animals; or dust control. Process wastewater also includes any water which comes into contact with any raw materials, products, or byproducts including manure, litter, feed, milk, eggs, or bedding. If the animal feeding operation is managing the waste generated at the facility as a liquid, a construction permit must be obtained pursuant to 401 KAR 5:005. Once defined as a CAFO, an operation must obtain either a KPDES General Permit or a KPDES Individual Permit depending upon the nature of the operation. Conditions of both types of permits include no discharge to surface waters. However, holders of a KPDES Individual Permit may discharge to surface waters during a 25-year (24-hour) or greater storm event. Currently, no AFOs or CAFOs have permits to discharge within the Beaver Creek watershed; therefore, a waste load allocation to AFOs or CAFOs does not apply.

## 5.2 Non-Permitted Sources (assigned a LA)

Non-permitted sources include all sources not permitted by the KPDES permitting program, and are often referred to as nonpoint sources. According to 401 KAR 10:001, nonpoint means "any source of pollutants not defined as a point source." While non-permitted sources are legal despite not having permits, their loads to surface water are still regulated by laws such as the Kentucky Agricultural Water Quality Act, federal Clean Water Act (i.e., the TMDL process) and 401 KAR 5:037 (Groundwater Protection Plans), among others. Non-permitted sources typically discharge pollutants to surface water in response to rain events. Rainfall data from the Price precipitation gage is shown in Figures 5.11 and 5.12 for the 2007 and 2008 PCR seasons, respectively (note: October 2008 data was not available at the time of writing of this document) (USGS, 2010). Red arrows indicate sampling dates for sites other than PRI095, which is displayed with the orange arrows. Of note is that samples collected during or following the June 27 and July 26, 2007 rain events tended to have much greater <u>E. coli</u> concentrations while samples collected on September 28, 2007, during a dry period, tended to have lower <u>E. coli</u> concentrations. These same trends were shown for samples collected during the July 31, 2008

rain event and during the August 22, 2008 extended dry period. These trends indicate that  $\underline{E}$ .  $\underline{coli}$  was being washed into the stream as the result of rainfall (see data in Appendix B).

Non-permitted sources for <u>E</u>. <u>coli</u> (and fecal coliform) exist in the watershed, and fall into various categories including agriculture, impacts directly attributable to humans, household pets and natural background such as from wildlife. All sources not regulated by the KPDES program will be allocated a pollutant load under the Load Allocation (LA) portion of the TMDL.

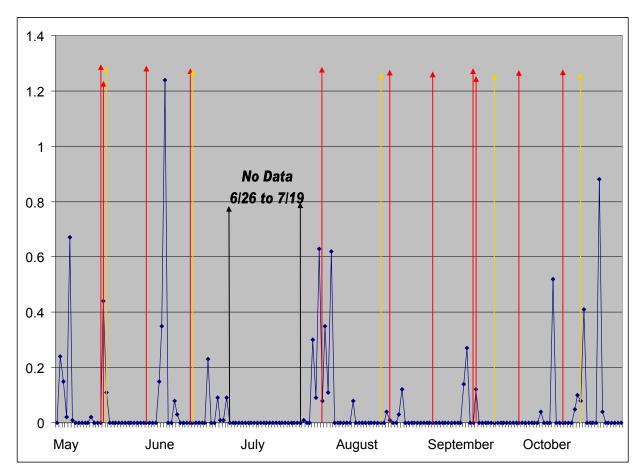


Figure 5.11 Daily Precipitation (inches) from Price Gage during the 2007 PCR Season

Note: No data indicates that the gage did not record information at that time. Red arrows indicate sampling dates for sites other than PRI095, which is displayed with the orange arrows.

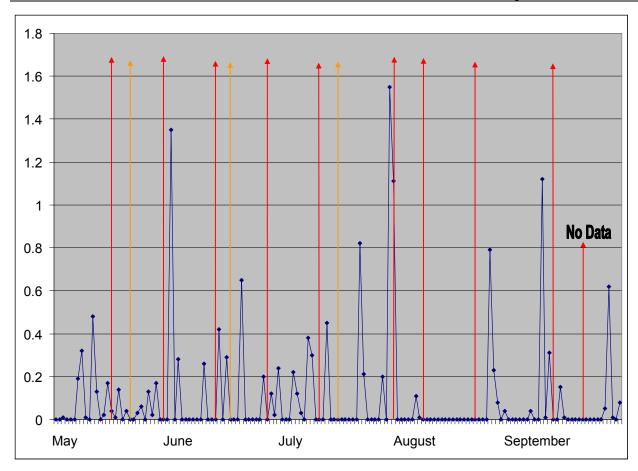


Figure 5.12 Daily Precipitation (inches) from Price Gage during the 2008 PCR Season Note: No data indicates that the gage did not record information at that time. Red arrows indicate sampling dates for sites other than PRI095, which is displayed with the orange arrows.

## 5.2.1 Human Waste Disposal

Human waste disposal is of particular concern in rural areas. One way to determine locations of potential un-sewered residential areas is to examine the difference between the locations of drinking water lines and sewer lines. This is shown in Figures 5.13 through 5.19. Proposed water and sewer lines are also displayed. These figures demonstrate that the majority of the Beaver Creek Watershed is not serviced by a sewer system. Additionally, some subwatersheds have no existing and no proposed sewer lines. The un-sewered areas either have Onsite Sewage Treatment and Disposal Systems (OSTDS; either permitted [Home Units] or unpermitted [septic tanks or other system]) or sewage is discharged via straight pipes.

The Kentucky Infrastructure Authority (KIA) compiled a report titled "Water Resource Development: A Strategic Plan for Wastewater Treatment" (KIA 2000) with data from the Regional Area Development Districts (ADDs). This report indicates that the Beaver Creek watershed has known failing septic systems and concentrations of straight pipes. The percent of population serviced by sewers (as of 1999) was approximately 20% for Floyd County and only

about 10% for Knott County. Non-permitted OSTDS, including septic tanks, are commonly used in areas where providing a centralized sewage collection and treatment system is not cost-effective or practical. When properly sited, designed, constructed, maintained, and operated, septic systems are an effective means of disposing and treating domestic waste. The effluent from a well-functioning OSTDS is comparable to secondarily treated wastewater from a sewage treatment plant. When not functioning properly, they can be a source of <u>E. coli</u> (or fecal coliform) and other pollutants (e.g., nitrogen and phosphorus) to both groundwater and surface water. The soils information presented in Section 3.3 indicates that the soils in the Beaver Creek watershed are not ideal for installation of properly functioning septic systems.

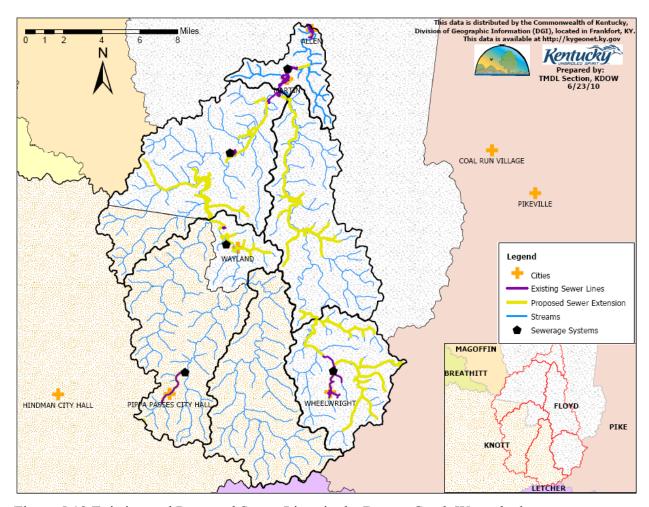


Figure 5.13 Existing and Proposed Sewer Lines in the Beaver Creek Watershed

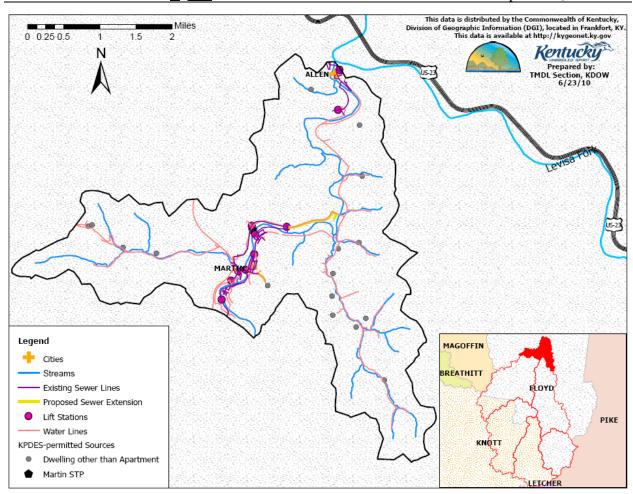


Figure 5.14 Existing and Proposed Water and Sewer Lines in the Mainstem Beaver Creek Subwatershed

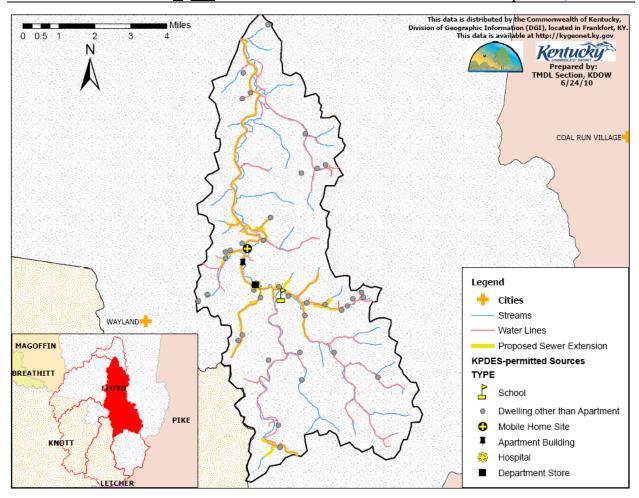


Figure 5.15 Existing and Proposed Water and Sewer Lines in the Lower Left Fork Beaver Creek Subwatershed

Note: No sewer lines are currently in this subwatershed.

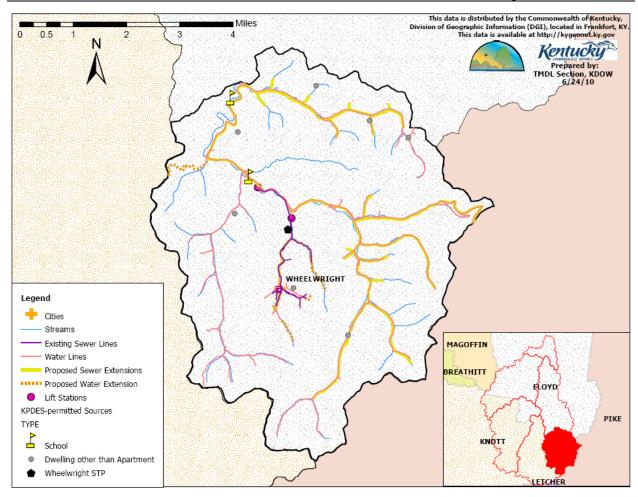


Figure 5.16 Existing and Proposed Water and Sewer Lines in the Upper Left Fork Beaver Creek Subwatershed

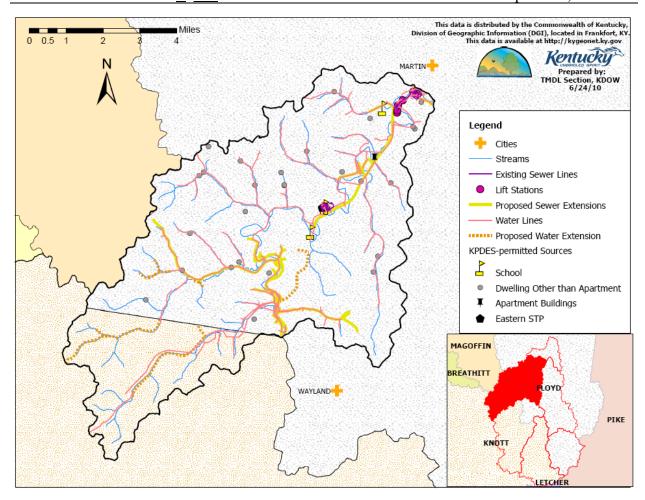


Figure 5.17 Existing and Proposed Water and Sewer Lines in the Lower Right Fork Beaver Creek Subwatershed

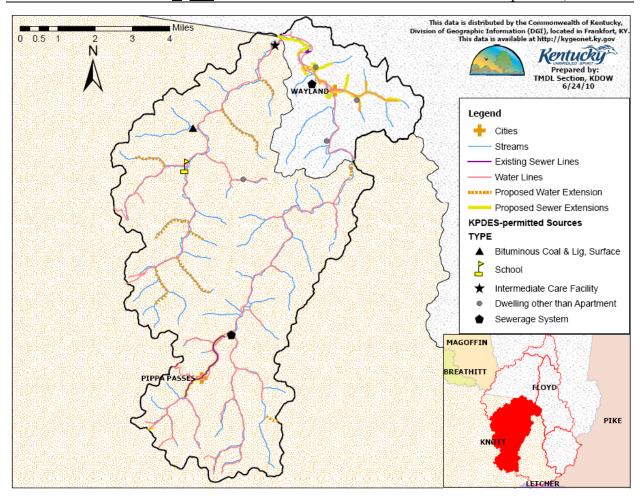


Figure 5.18 Existing and Proposed Water and Sewer Lines in the Middle Right Fork Beaver Creek Subwatershed

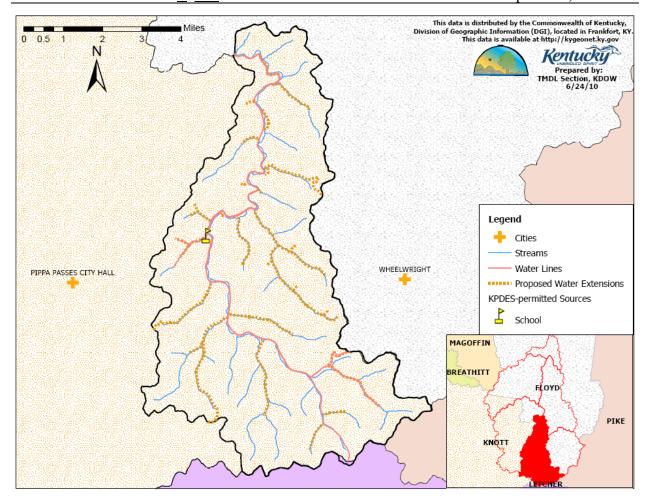


Figure 5.19 Proposed Water and Sewer Lines in the Upper Right Fork Beaver Creek Subwatershed

Note: No sewer lines are currently in this subwatershed and none are proposed.

# **5.2.2 Agriculture**

The Kentucky Agriculture Water Quality Act (KRS 224.71-100 through 224.71-140) was passed by the 1994 General Assembly. The law focuses on the protection of surface water and groundwater resources from agricultural and silvicultural activities. The Act created the Kentucky Agriculture Water Quality Authority (KAWQA), a 15-member peer group made up of farmers and representatives from various agencies and organizations. The Act requires all farms greater than 10 acres in size to adhere to the Best Management Practices (BMPs) specified in the Kentucky Agriculture Water Quality Plan. Specific BMPs have been designated for all operations.

The U.S. Department of Agriculture (USDA) compiles agricultural statistics at the county level and reports results every five years in Agricultural Census reports. Select agricultural statistics reported in 2007 for the counties in the Beaver Creek Watershed are shown in Table 5.2 (USDA, 2007).

Table 5.2 Agricultural Statistics (2007)

| Statistic   | County     |            |
|---|------------|------------|
| Staustic  | Floyd      | Knott      |
| Farms [# farms (acres)]   | 76 (7,785) | 46 (6,937) |
| Cattle and Calves Inventory [#farms (total # animals)]              | 32 (431)   | 20 (695)   |
| Beef [#farms (total # animals)]                                     | 27 (232)   | 19 /(D)    |
| Milk Cows [#farms (total # animals)]                                | - (-)      | 1 (D)      |
| Hogs and Pigs [#farms (total # animals)]                            | 3 (15)     | - (-)      |
| Sheep and Lambs [#farms (total # animals)]                          | 2 (D)      | 1 (D)      |
| Layers 20 weeks old or older [#farms (total # animals)]             | 6 (86)     | 6 (120)    |
| Broilers & other meat-type chickens sold [#farms (total # animals)] | - (-)      | - (-)      |
| Total Cropland [#farms (total acres)]                               | 61 (2,002) | 19 (2,704) |
| Corn for grain [#farms (total acres)]                               | 11 (276)   | - (-)      |
| Wheat for grain [#farms (total acres)]                              | - (-)      | - (-)      |
| Corn for silage [#farms (total acres)]                              | - (-)      | - (-)      |

D = Withheld by USDA to avoid disclosing data for individual farms.

#### **5.2.3 Kentucky No Discharge Operating Permit (KNDOP)**

As stated in 401 KAR 5:005, facilities with agricultural waste handling systems or that dispose of their effluent by spray irrigation but do not discharge to surface waters are required to obtain a KNDOP from the KDOW prior to construction and operation. These operations handle liquid waste in a storage component of the operation (e.g. lagoon, pit, or tank) and land apply the waste via spray irrigation or injection to cropped acreages. Land application of the waste that results in

<sup>-</sup> = No data.

runoff to a stream is prohibited. Facilities that handle animal waste as a liquid are required to submit a Short Form B, construction plans, and a Comprehensive Nutrient Management Plan to the KDOW. Also included in KNDOP requirements are golf courses which land apply treated wastewater via spray irrigation, typically from a holding pond - some industrial operations also spray-irrigate. There are no KNDOPs in the Beaver Creek watershed.

#### 5.2.4 Wildlife

Wildlife undoubtedly contribute  $\underline{E}$ .  $\underline{\operatorname{coli}}$  (or fecal coliform) to the Beaver Creek watershed, noting the high percentage of forest in all subwatersheds. Table 5.3 shows the estimates of deer population and density by county in the Beaver Creek watershed, as provided by the Kentucky Department of Fish and Wildlife Resources (Kentucky Department of Fish and Wildlife Resources, 2006). Estimates on numbers of other types of animals are not available; however, there is an Elk release site in the watershed and several wildlife management areas exist as shown in Figures 5.20 and 5.21. Although wildlife contribute  $\underline{E}$ .  $\underline{\operatorname{coli}}$  (or fecal coliform) to surface water, such contributions represent natural background conditions, and do not receive a reduction as part of the TMDL.

Table 5.3 Deer Density in Counties of Beaver Creek Watershed

| County | Deer Per Square Mile | Total Number of Deer |
|--------|----------------------|----------------------|
| Floyd  | 8                    | 3,258                |
| Knott  | 12                   | 4,052                |

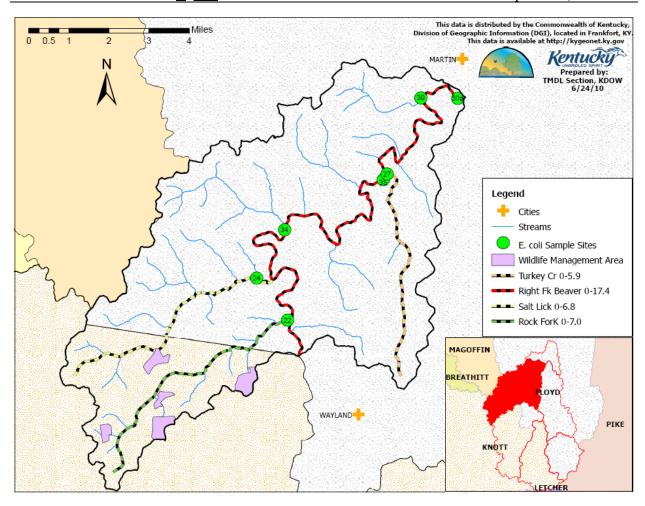


Figure 5.20 Wildlife Management Areas in the Lower Right Fork Beaver Creek Subwatershed

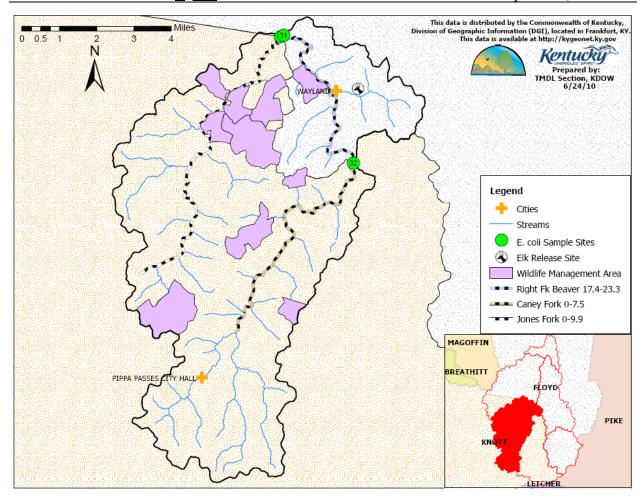


Figure 5.21 Wildlife Management areas and Elk Release Site in the Middle Right Fork Beaver Creek Subwatershed

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 20 is under site 31.

#### **5.2.5** Household Pets

Although household pets undoubtedly exist in these watersheds, their contribution is deemed to be minimal compared to other sources.

## **5.2.6 Illegal LA Sources**

Illegal LA sources related to human waste disposal include failing septic systems, and straight pipes. Straight pipes receive a LA of 0 while failing septic tanks receive an LA equivalent to a properly functioning septic system (i.e. only the load above that of a properly functioning system receives a LA of 0). In the course of eliminating failing septic systems and straight pipes that exist in the watershed, the pollutant load carried could be routed to functional septic systems, to an existing sewage treatment plant, or possibly to a future KPDES-permitted point source such as a package treatment plant or permitted home unit for an individual residence. If routed to functional septic systems, the load will be reduced between 99% and 99.9%, after pathogen

losses in the soil column are accounted for (EPA, 2002). If routed to a KPDES-permitted source, it must conform to the requirements for these sources.

Note this Section of the TMDL is not intended to summarize the universe of potential illegal LA sources that may discharge pollutants into surface waters. Instead, it defines the illegal LA sources known to be present in this watershed (failing septic systems and straight pipes).

# 6.0 Total TMDL

The WQC in 401 KAR 10:031 (Kentucky's Surface Water Standards) for the PCR use are based on both fecal coliform bacteria and <u>E</u>. <u>coli</u> bacteria. For this TMDL, the <u>E</u>. <u>coli</u> criterion was applied as the samples were not analyzed for fecal coliform. Per 401 KAR 10:031:

"The following criteria shall apply to waters designated as primary contact recreation use during the primary contact recreation season of May 1 through October 31: Fecal coliform content or <u>Escherichia coli</u> content shall not exceed 200 colonies per 100 ml or 130 colonies per 100 ml respectively as a geometric mean based on not less than five (5) samples taken during a thirty (30) day period. Content also shall not exceed 400 colonies per 100 ml in twenty (20) percent or more of all samples taken during a thirty (30) day period for fecal coliform or 240 colonies per 100 ml for <u>Escherichia coli</u>."

#### Additionally:

"The following criteria shall apply to waters designated for secondary contact recreation use during the entire year: Fecal coliform content shall not exceed 1000 colonies per 100 ml as a thirty (30) day geometric mean based on not less than five (5) samples; nor exceed 2000 colonies per 100 ml in twenty (20) percent or more of all samples taken during a thirty (30) day period."

There are insufficient <u>E</u>. <u>coli</u> measurements to calculate a 5-sample, 30-day geometric mean, so the instantaneous criterion of 240 colonies per 100 ml was applied to calculate allowable loadings to bring the watershed into compliance with the PCR designated use. See Section 7.0 for TMDL loading calculations.

# 7.0 Methodology

A TMDL calculation (as defined in Section 1.2) is performed as follows:

$$TMDL = WLA + LA + MOS$$

The WLA has two components:

WLA = KPDES-permitted WLA + Future Growth WLA

Because <u>E</u>. <u>coli</u> colonies are expressed as a concentration, a method must be used to convert the allowable concentration of bacteria to an allowable load. Additionally, a method to divide this allowable load to sources in the watershed must be used.

The Water Quality Criteria (WQC) in 401 KAR 10:031 (Kentucky's Surface Water Standards) for the PCR use are based on both fecal coliform and <u>E</u>. <u>coli</u> bacteria. For this TMDL document, the <u>E</u>. <u>coli</u> criterion for PCR use was applied. The criterion states that <u>E</u>. <u>coli</u> shall not exceed 130 colonies/100 ml as a geometric mean based on not less than 5 samples taken during a 30-day period and shall not exceed 240 colonies/per 100 ml in 20% or more of all samples taken during a 30-day period. These limits are applicable during the recreation season of May 1 through October 31

There are insufficient  $\underline{E}$ .  $\underline{coli}$  measurements to calculate a 5-sample, 30-day geometric mean, so the criterion of 240 colonies/100 ml was used as the WQC in order to calculate TMDLs to bring impaired segments into compliance with the PCR designated use. Because Kentucky has a dual standard for the PCR designated use, development of TMDLs using the  $\underline{E}$ .  $\underline{coli}$  criterion are sufficient to provide TMDLs for fecal coliform listed segments (i.e., development of  $\underline{E}$ .  $\underline{coli}$  TMDLs will protect the PCR use regardless of whether a segment is impaired for  $\underline{E}$ .  $\underline{coli}$ , fecal coliform, or both indicators). Additionally, because the instantaneous limit is lower for PCR than for SCR (400 colonies/ml versus 2000 colonies/ml) development of TMDLs for the PCR season also protects segments impaired for the SCR use due to fecal coliform.

#### 7.1 Data Validation

Data collected by Eastern Kentucky University for this TMDL was validated as follows:

- <u>E</u>. <u>coli</u> samples taken outside the PCR months of May through October were not considered during TMDL analysis.
- Quality Analysis/Quality Control Samples (e.g., duplicates) were not considered during TMDL analysis.
- Some samples were reported using either the *less than* (denoted using the "<") symbol or the *greater than* (denoted using the ">") symbol, indicating the true concentration was unknown but was either below or above the reported value, respectively. For these samples, the reported value was used verbatim. For *greater than* values, the exact value of the exceedance is unknown and likely higher than the number reported, however the

sample still provides insight into the status of the waterbody at the time the sample was taken.

- Only samples collected from a flowing stream were considered in analysis.
- Discharge data that consisted of velocity alone (no stream area determined) was eliminated from consideration in the analysis.
- Any discharge data that was indicated to be suspect due to possible operator error was eliminated from consideration in the analysis.

## **7.2 TMDL Components**

The TMDL calculation must take into account seasonality and other factors that affect the relationship between pollutant inputs and the ability of the stream to meet its designated uses.

# 7.2.1 Seasonality

In Kentucky regulations, the PCR use is defined to apply to the period beginning May 1 and ending October 31. For this TMDL, seasonality is considered because samples were collected twice a month to provide data over the entire PCR season.

#### 7.2.2 Critical Condition

The critical condition for nonpoint source  $\underline{E}$ .  $\underline{coli}$  (or fecal coliform) loadings is typically an extended dry period followed by a rainfall runoff event. During the dry weather period, pathogen indicators build up on the land surface, and are washed off by subsequent rainfall. Conversely, the critical condition for point source loading typically occurs during periods of low stream flow when dilution is minimized. Sampling was performed during both types of conditions (during or following rain events and during extended dry periods). The Beaver Creek watershed contains both types of sources; therefore the critical condition for each impaired segment is defined by the sample showing the greatest concentration, which was generally collected during rainfall events.

#### 7.2.3 Determine Mean Annual Flow

The Pathogen TMDL SOP (KDOW, 2009) was followed to determine flows and TMDLs for this document. The USGS publishes Mean Annual Flow (MAF) data on the internet via the "Hydrology of Kentucky" geographic data explorer (http://kygeonet.ky.gov/kyhydro/main.htm). The MAF is calculated from multiple regression equations found in the USGS Report "Low-Flow Characteristics of Kentucky Streams" (Martin 2002). Mean Annual Flows were used to convert concentrations of  $\underline{E}$ .  $\underline{coli}$  into loads of  $\underline{E}$ .  $\underline{coli}$ . The MAF was determined at the downstream end of each impaired segment. When multiple sites were located on one impaired segment, the MAF for upstream sites was determined at the sample site location while it was determined at the end of the impaired segment for the downstream-most site. The MAF for each site was then adjusted by either adding or subtracting flow based on any KPDES-permitted dischargers of pathogen indicators or KDOW permitted stream water withdrawals in the watershed upstream of a sample site (yielding the Adjusted MAF for that site). The additions for KPDES-permitted sources of pathogen indicators were set at the design capacity (in cfs) of the facility. The subtractions for stream water withdrawals were set at the maximum permitted water withdrawal (in cfs). Water withdrawals from groundwater or from surface impoundments

was assumed not to impact in-stream flow so water withdrawals of these types were not subtracted from the MAF.

## 7.2.4 Existing Loads

Although not a part of a TMDL, existing loads were determined using the monitoring data collected by EKU. Existing loads provide a basis by which to determine the percent reduction that would have been required to meet the TMDL limits at the time of sample collection. For each sample site, the sample with the greatest concentration of <u>E</u>. <u>coli</u> was used as the existing concentration for the site. This provides a worst-case scenario for percent reduction calculations (i.e., the percent reduction is the greatest required to bring existing loads to the TMDL loading requirements). Existing loads were calculated as:

where the conversion factor converts cfs to ml/day and colonies to billion colonies.

#### 7.2.5 Total TMDL

The Total TMDL is the allowable loading in a watershed. Loads are portioned from this load to the MOS, WLA, and LA.

Total TMDLs were calculated for each site using the E. coli criterion of 240 colonies/100 ml:

#### 7.2.6 Calculation of Margin of Safety

There are two methods for incorporating a MOS in the TMDL analysis: implicitly include the MOS using conservative assumptions, or explicitly set aside a (numerical) portion of the TMDL as the MOS. For this TMDL, a 10% explicit MOS (i.e., 10% of the WQC, or 24 colonies/100ml,) was set. Additionally, an implicit MOS was incorporated in loading calculations for KPDES-permitted sources by setting their flow at the maximum design capacity. The explicit MOS load for each site was calculated as:

$$\begin{array}{c} 24 \\ \text{(colonies/100ml)} \end{array} \times \begin{array}{c} \text{Adjusted} \\ \times \quad \text{MAF} \\ \text{(cfs)} \end{array} \times \begin{array}{c} \text{Conversion Factor} \\ \text{.0244657584} \end{array} = \begin{array}{c} \text{MOS (billion colonies/day)} \end{array}$$

#### 7.2.7 Calculation of Target Load

The Target Load is defined as the load at the WQC minus the explicit MOS load. It was calculated for each site by subtracting the explicit MOS from the Total TMDL:

Target Load = Total TMDL - MOS.

It can also be calculated as:

#### 7.2.8 Calculation of Percent Reduction

A percent reduction is not part of the TMDL calculation, however, for informational purposes, a percent reduction was calculated for each site to show the percent reduction that would have been required at the time the samples were taken in order to meet the Target Load. The percent reduction was calculated as:

While providing additional information, the percent reduction calculation is not equivalent to the TMDL. The TMDL is the load that the waterbody can assimilate while still meeting its designated uses (i.e., PCR and SCR). The percent reduction is a determination of how much the measured concentration exceeded the Target Load at the time the samples were taken. It does not determine the percent reduction needed at any other time, as the in-stream concentrations are likely to be different. Unlike the calculated percent reductions, the TMDL is a constant based upon the WQC whereas the percent reduction changes based on in-stream concentrations.

Regardless of the procedure used to estimate percent reductions for each sampling station, reductions from existing conditions ultimately must be effected within a given watershed only until all stream segments meet the PCR use, or until all sources save wildlife are discharging in compliance with the WQC. However, once the WQC is met, all sources (save wildlife) must continue to discharge at a concentration that meets the WQC.

#### 7.2.9 Calculation of WLAs for Each KPDES Permitted Source

The WLA is the allocation given to KPDES-permitted sources within the TMDL. For these sources, the WLAs are calculated based on the permitted concentration limits and facility design flow (in units of cfs) using the following equation:

The design capacity in MGD was converted to cfs by multiplying by 1.54723 to convert days to seconds and million gallons to cubic feet.

#### 7.2.10 Calculation of Remainder

The Remainder is not part of the TMDL; however, it is used in the TMDL calculations. It is determined as the Target Load minus the sum of all WLAs for KPDES-permitted sources.

## 7.2.11 Calculation of Future Growth WLA

Because the WLA must account for all KPDES-permitted sources, TMDLs will often account for future growth of these sources (i.e., an increase in the number of KPDES-permitted sources or in the loading per discharger) in order to avoid having to re-open the TMDL and change the WLA when new or expanding sources come online. Future growth is represented by a portion of the TMDL Target which is set aside (i.e., is not part of the LA nor is it part of the WLA for current/known sources). It can also account for existing storm water sources which are later discovered to discharge the pollutant of concern, even though this fact was not known at the time the TMDL was written. Of course, any and all of the sources mentioned above must meet the WQC and KDOW's permitting requirements. The amount set aside for future growth is determined by the following formula, which assumes that growth occurs more rapidly in developed areas (which is determined by the sum of developed open space, developed low intensity, developed medium intensity and developed high intensity areas) than in rural areas:

Table 7.1 Future Growth WLA Formula

| Percent Developed Area in the Subwatershed | % of Remainder Set Aside for Future Growth WLA |
|--|--|
| ≥25%                                       | 5%   |
| ≥20% - <25%                                | 4%   |
| ≥15% - <20%                                | 3%   |
| ≥10% - <15%                                | 2%   |
| ≥5% -<10%                                  | 1%   |
| <5%  | 0.5%   |

The Future Growth WLA is calculated as the Remainder multiplied by the appropriate percentage from Table 7.1.

Future Growth WLA = Remainder \* Future Growth WLA percentage

#### 7.2.12 Calculation of LA

The LA is where non-KPDES-permitted sources (e.g., nonpoint sources, or those sources not permitted by KPDES) receive their allocation within the TMDL. Non-KPDES-permitted sources include non-KPDES permitted OSTDS (i.e. septic systems), wildlife, household pets and facilities (e.g., farms, landfarms for municipal STP sludge) with properly functioning BMPs. Facilities with failing or non-existing BMPs as well as failing septic systems are also included in the LA, but these are illegal sources and KDOW expects compliance efforts to target these sources for elimination so that legally operating sources do not bear the burden of implementing reductions beyond achieving the WQC in order to accommodate the loading from illegal sources. Load Allocations are calculated for each site as follows:

LA= Remainder – Future Growth WLA.

The available sampling data were insufficient to apportion the existing loading among the various LA sources; therefore, it is lumped to all LA sources.

# 7.3 Determining TMDL for Impaired Segment

If there was only one sample site on an impaired segment, the TMDL for that site is the TMDL for the impaired segment. There were a few cases where multiple sites were sampled on one impaired segment. When this occurred, the TMDL was determined using the MAF from the downstream station, while the existing condition and percent reduction were determined by the greatest exceedance (see Section 7.2.4). Note that the TMDL, WLAs, MOS, LA, and Future Growth WLA for the downstream-most site do not change by inserting this greatest exceedance into calculations for the downstream-most site, only the existing load and percent reduction change. This is because TMDLs were determined by the WQC for E. coli, not by the sample data that were collected. In other words, the WQC determines where the stream needs to be while the sample data determines how far it has to go to get there.

## 7.4 Additional Calculations

In addition to TMDL calculations, calculations of instantaneous loads and unit area loads were performed on the sample data. This provides information about actual loadings observed in the watershed at the time of sampling. Instantaneous loads were calculated on each sample result (if flow was also measured) as follows:

Observed 
$$\underline{E}$$
.

Concentration

Concentration

Observed

Flow

Conversion Factor

(cfs)

Conversion Factor

0244657584

Conversion Factor

0244657584

= Instantaneous Load

(billion colonies/day)

These instantaneous loads were then converted to unit area loads in million colonies/day/acre by dividing by the watershed area (in acres) and multiplying by 1000 to convert from billion colonies/day to million colonies/day. This provides information about how much load is coming from each acre of land in the subwatershed above the sample site. This varies as the <u>E. coli</u>

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concentration changes across sample dates. By comparing unit area loads across sites on one sample date, subwatersheds that contribute greater loadings of bacteria can be identified (see unit area load results in Appendix D).

# 8.0 TMDLs for Individual Stream Segments

In order to group the subwatersheds affected by this TMDL report in a logically progressive way, an analysis of impaired segments is presented beginning at the headwaters of the Left Fork moving downstream to its mouth, the headwaters of the Right Fork moving downstream to its mouth, then progressing downstream on Beaver Creek.

Descriptions of each impaired subwatershed are presented along with tables of land cover, general subwatershed information, sample data, water withdrawals (if any), and TMDL allocations. The land cover table for each segment includes the percentage used to calculate the Future Growth WLA. The Waterbody Identification number (WBID) is included in the table of general information about the impaired segment. This number is a unique identifier assigned to all assessed waters in KY.

The TMDL tables include KPDES-permitted source information and TMDL allocations and can be interpreted as follows:

The columns with the blue highlight indicate the TMDL allocations. The rows with green highlight indicate KPDES permit information and the design capacity (in cfs) that feeds into the WLA calculation for each KPDES-permitted source. The WLA (in blue) for a particular KPDES-permitted source is on the same row as the information for the KPDES-permitted source (in green). The purple highlight indicates the sum of KPDES flow inputs that were added to the MAF of each site.

For segments with multiple sample sites, only the TMDL table for the impaired segment is shown in Section 8. However, TMDL tables for the additional sites are shown in Appendix E.

#### 8.1 Caleb Fork RM 0.0 to 1.2

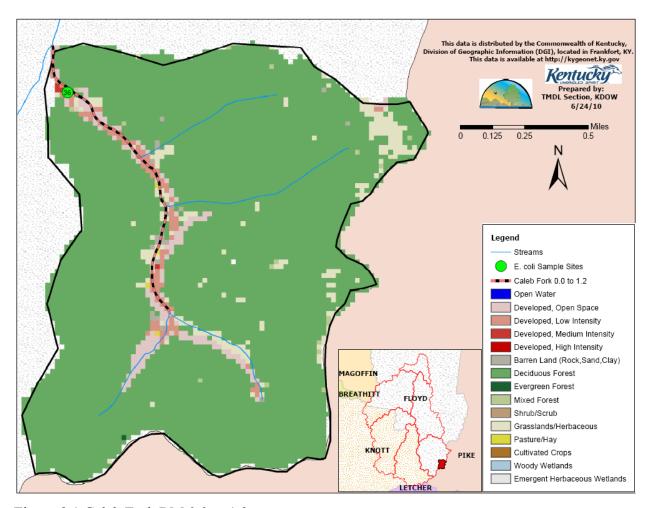


Figure 8.1 Caleb Fork RM 0.0 to 1.2

Caleb Fork is a second order stream located in the Upper Left Fork Beaver Creek subwatershed in Floyd County (Figure 8.1). Information about Caleb Fork, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.1. The WBID number for all sites is a unique identifier issued by the Division of Water for all assessed segments. It is based upon the USGS Geographic Names Information System (USGS, 1999) with a KY in front of the GNIS number and a \_## where ## is a segment identification number. To save space, the KY has been left off the beginning of the WBID #. Caleb Fork has a catchment of 1,220 acres (1.9 square miles) with a 90% forested and 4.8 % developed land cover (Table 8.2). This subwatershed is entirely un-sewered. This subwatershed has neither KPDES-permitted pathogen dischargers nor water withdrawals. Sampling data from site 36 is presented in Table 8.3, and the TMDL allocations in Table 8.4.

Table 8.1 Caleb Fork RM 0.0 to 1.2 Information

| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |       |       |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|-------|-------|----------|
|        | Caleb             |           |          |           |                 |               |       |       |          |
| Caleb  | Fork 0.0          |           |          |           |                 |               |       |       |          |
| Fork   | to 1.2            | 488598_01 | Floyd    | 1220.19   | 1.907           | 2nd order     |       |       |          |
|        |                   |           |          |           |                 |               |       | -     |          |
|        |                   |           | Sample   | Sample    |                 |               | + to  | from  | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF   | MAF   | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs) | (cfs) | (cfs)    |
| 36     | 36                | 0.2       | 37.32805 | -82.6898  | 2.7             | 0             | 0     | 0     | 2.7      |

Table 8.2 Caleb Fork RM 0.0 to 1.2 Subwatershed Land Cover

|                      | Watershed | Watershed    |                 | Future<br>Growth |
|----------------------|-----------|--------------|-----------------|------------------|
| Land Cover           | Acres     | Square Miles | % of Total Area | WLA %            |
| Open Water           | 0.00      | 0.00         | 0.00            |                  |
| Developed            | 58.31     | 0.09         | 4.78            | 0.5              |
| Barren Land          | 5.12      | 0.01         | 0.42            |                  |
| Forest/Shrubland     | 1108.03   | 1.73         | 90.81           |                  |
| Grassland/Herbaceous | 47.85     | 0.07         | 3.92            |                  |
| Pasture/ Hay         | 0.89      | 0.00         | 0.07            |                  |
| Cultivated Crops     | 0.00      | 0.00         | 0.00            |                  |
| Wetlands             | 0.00      | 0.00         | 0.00            |                  |
| Total                | 1220.19   | 1.91         | 100.00          |                  |

Table 8.3 Caleb Fork RM 0.0 to 1.2 Data (Site 36)

| Table 8.5 Calculfolk Kivi |                        | (510 50) | <b>.</b>                  |                                 |
|---------------------------|------------------------|----------|---------------------------|---------------------------------|
|                           | <u>E</u> . <u>coli</u> |          | Instantaneous             | Unit Area Load                  |
|                           | (colonies/100          | Flow     | Load (billion <u>E</u> .  | (million <u>E</u> . <u>coli</u> |
| Collection Date           | mls)                   | (cfs)    | <u>coli</u> colonies/day) | colonies/day/acre)              |
| 05/16/08                  | 11000                  | 1.085    | 292.00                    | 239.31                          |
| 05/30/08                  | 17000                  | 4.3302   | 1801.01                   | 1476.01                         |
| 06/13/08                  | 3400                   | N/A      | N/A                       | N/A                             |
| 6/13/08 (QA Sample)       | 2900                   | N/A      | N/A                       | N/A                             |
| 06/27/08                  | 3000                   | 0.326    | 23.93                     | 19.61                           |
| 07/11/08                  | 5300                   | N/A      | N/A                       | N/A                             |
| 07/31/08                  | 17000                  | 0.308    | 128.10                    | 104.99                          |
| 08/08/08                  | 3600                   | 0.260    | 22.90                     | 18.77                           |
| 08/22/08                  | 800                    | 0.07     | 1.37                      | 1.12                            |
| 09/12/08                  | 2600                   | 0.1      | 6.36                      | 5.21                            |
| 09/20/08                  | 5000                   | 0.0334   | 4.09                      | 3.35                            |
| 10/17/08                  | >80000                 | 0.211    | 412.98                    | 338.46                          |
| 10/24/08                  | 240                    | 0.088    | 0.52                      | 0.42                            |
| Greatest Concentration    | 80000                  |          |                           |                                 |

Table 8.4 TMDL Calculations for Caleb Creek RM 0.0-1.2

|               |            | ations for Cal                 |                                       | 211 010 112                 |                                |  |
|---------------|------------|--------------------------------|---------------------------------------|-----------------------------|--------------------------------|--|
| TMDL<br>Table |            |                                |                                       |                             | E. coli (billion colonies/day) |  |
|               |            |                                |                                       |                             | 5284.6038                      | Existing Load                          |
|               |            |                                |                                       |                             | 15.8538                        | Total TMDL                             |
|               |            |                                |                                       |                             | 1.5854                         | MOS                                    |
|               |            |                                |                                       |                             | 14.2684                        | TMDL Target                            |
| AI number     | KPDES<br># | Discharger<br>Facility<br>Name | Туре                                  | Design<br>Capacity<br>(cfs) | 99.73                          | % reduction                            |
| N/A           | N/A        | N/A                            | N/A                                   | N/A                         | 0.0000                         | KPDES<br>WLA                           |
|               |            |                                | Addition<br>to MAF<br>(sum of<br>cfs) | 0.00                        | 14.2684                        | remainder                              |
|               |            |                                |                                       |                             | 0.0713                         | Future<br>Growth<br>WLA <sup>(1)</sup> |
|               |            |                                |                                       |                             | 0.0713                         | Total WLA                              |
|               |            |                                |                                       |                             | 14.1971                        | LA                                     |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

### 8.2 Clear Creek RM 0.0 to 4.9

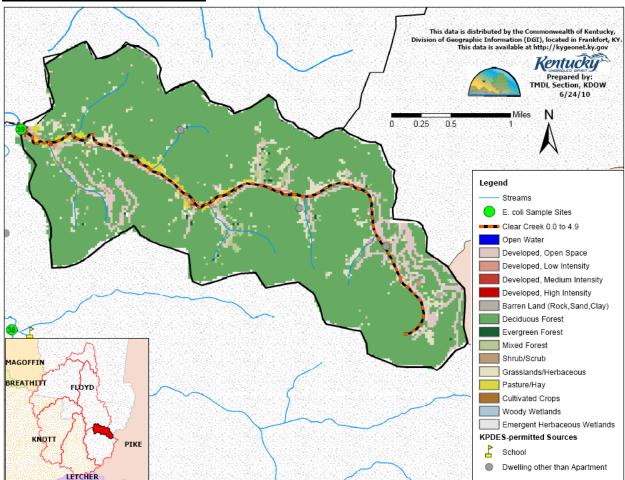


Figure 8.2 Clear Creek RM 0.0 to 4.9

Clear Creek is a third order stream located in the Upper Left Fork Beaver Creek subwatershed in Floyd County (Figure 8.2). Information about Clear Creek, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.5. It has a catchment of 3,308 acres (5.2 square miles) with an 86% forested and 7% developed land cover (Table 8.6). This subwatershed is entirely un-sewered. There are no stream water withdrawals in this subwatershed. Sampling data from site 39 is presented in Table 8.7 and TMDL allocations in Table 8.8.

Table 8.5 Clear Creek RM 0.0 to 4.9 Information

|        | Stream    |         |          |           | Square |               |         |       |          |
|--------|-----------|---------|----------|-----------|--------|---------------|---------|-------|----------|
| Stream | Segment   | WBID#   | County   | Acres     | Miles  | Stream Order  |         |       |          |
|        | Clear     |         |          |           |        |               |         |       |          |
| Clear  | Creek 0.0 | 489611_ |          |           |        |               |         |       |          |
| Creek  | to 4.9    | 01      | Floyd    | 3307.66   | 5.17   | 3rd order     |         |       |          |
|        |           |         |          |           |        |               |         | -     |          |
|        |           | Sample  | Sample   | Sample    |        |               | + to    | from  | Adjusted |
| EKU    | MAP Site  | Point   | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF   | MAF      |
| Site # | #         | RM      | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs) | (cfs)    |
| 39     | 39        | 0.05    | 37.38850 | -82.73075 | 7.1    | 0             | 0.00232 | 0     | 7.1023   |

Table 8.6 Clear Creek RM 0.0 to 4.9 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 0.00      | 0.00         | 0.00       |               |
| Developed            | 231.83    | 0.36         | 7.01       | 1.0           |
| Barren Land          | 22.25     | 0.03         | 0.67       |               |
| Forest/Shrubland     | 2836.22   | 4.43         | 85.75      |               |
| Grassland/Herbaceous | 170.64    | 0.27         | 5.16       |               |
| Pasture/Hay          | 46.05     | 0.07         | 1.39       |               |
| Cultivated Crops     | 0.44      | 0.00         | 0.01       |               |
| Wetlands             | 0.22      | 0.00         | 0.01       |               |
| Totals               | 3307.66   | 5.17         | 100.00     |               |

Table 8.7 Clear Creek RM 0.0 to 4.9 Data (Site 39)

|                        | E. coli<br>(colonies/100 | Flow   | Instantaneous Load (billion <u>E</u> . coli | Unit Area Load<br>(million E. coli |
|------------------------|--------------------------|--------|---|------------------------------------|
| Collection Date        | mls)                     | (cfs)  | colonies/day)                               | colonies/day/acre)                 |
| 05/16/08               | 200                      | 1.045  | 5.11  | 1.55                               |
| 05/30/08               | 220                      | 0.9205 | 4.95  | 1.50                               |
| 06/13/08               | 710                      | 1.003  | 17.42                                       | 5.27                               |
| 06/27/08               | 310                      | 0.625  | 4.74  | 1.43                               |
| 6/27/08 (QA Sample)    | 330                      | N/A    | N/A   | N/A                                |
| 07/11/08               | 330                      | 0.692  | 5.59  | 1.69                               |
| 07/31/08               | >80000                   | 8.345  | 16333.34                                    | 4938.03                            |
| 7/31/08 (QA Sample)    | 31000                    | N/A    | N/A   | N/A                                |
| 08/08/08               | 290                      | 0.491  | 3.48  | 1.05                               |
| 08/22/08               | 470                      | 0.322  | 3.70  | 1.12                               |
| 09/12/08               | 1800                     | 0.656  | 28.89                                       | 8.73                               |
| 09/20/08               | 320                      | 0.1716 | 1.34  | 0.41                               |
| 10/17/08               | 280                      | 0.484  | 3.32  | 1.00                               |
| 10/24/08               | 120                      | 0.184  | 0.54  | 0.16                               |
| Greatest Concentration | 80000                    |        |   |                                    |

Table 8.8 TMDL for Clear Creek RM 0.0-4.9

| 1 able 8.8    | TMDL for Cie | ar Creek RM 0.0                | J <b>-</b> 4.9                      | T                           |                                      |                       |
|---------------|--------------|--------------------------------|-------------------------------------|-----------------------------|--------------------------------------|-----------------------|
| TMDL<br>Table |              |                                |                                     |                             | E. coli<br>(billion<br>colonies/day) |                       |
|               |              |                                |                                     |                             | 13901.0933                           | Existing Load         |
|               |              |                                |                                     |                             | 41.7033                              | Total<br>TMDL         |
|               |              |                                |                                     |                             | 4.1703                               | MOS                   |
|               |              |                                |                                     |                             | 37.5330                              | TMDL<br>Target        |
| AI<br>number  | KPDES#       | Discharger<br>Facility<br>Name | Туре                                | Design<br>Capacity<br>(cfs) | 99.73                                | % reduction           |
| 1266          | KYG400970    | MEADE<br>RESIDENCE             | Dwelling<br>Other than<br>Apartment | 0.0007736                   | 0.0045                               | KPDES<br>WLA          |
| 1173          | KYG400790    | COOK<br>RESIDENCE              | Dwelling<br>Other than<br>Apartment | 0.0007736                   | 0.0045                               | KPDES<br>WLA          |
| 1237          | KYG400753    | BINGHAM<br>RESIDENCE           | Dwelling<br>Other than<br>Apartment | 0.0007736                   | 0.0045                               | KPDES<br>WLA          |
|               |              |                                |                                     |                             | 0.0136                               | Total<br>KPDES<br>WLA |
|               |              |                                | Addition                            |                             |                                      |                       |
|               |              |                                | to MAF                              |                             |                                      |                       |
|               |              |                                | (sum of                             | 0.0022200                   | 27.5102                              |                       |
|               |              |                                | cfs)                                | 0.0023208                   | 37.5193                              | remainder             |
|               |              |                                |                                     |                             |                                      | Future                |
|               |              |                                |                                     |                             |                                      | Growth                |
|               |              |                                |                                     |                             | 0.3752                               | WLA <sup>(1)</sup>    |
|               |              |                                |                                     |                             | 0.3888                               | Total<br>WLA          |
|               |              |                                |                                     |                             | 37.1441                              | LA                    |
|               |              |                                |                                     |                             | 37.1441                              | LA                    |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

# 8.3 Jacks Creek RM 0.0 to 4.4

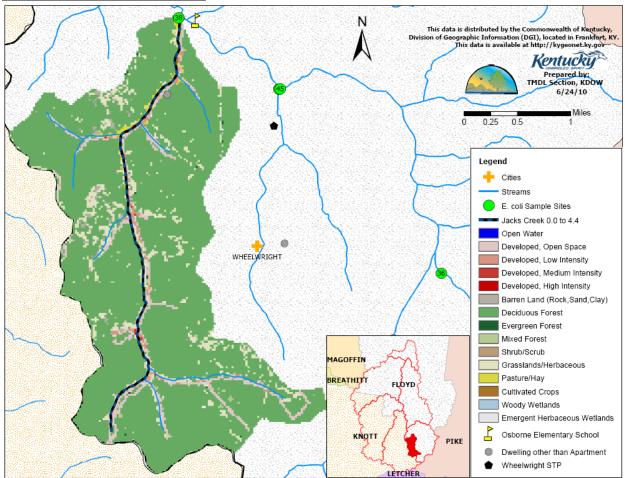


Figure 8.3 Jacks Creek RM 0.0 to 4.4

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 37 is under site 45.

Jacks Creek is a third order stream located in the Upper Left Fork Beaver Creek subwatershed in Floyd County (Figure 8.3). Information about Jacks Creek, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.9. It has a catchment of 3,721 acres (5.8 square miles) with an 86% forested and 5.4% developed land cover (Table 8.10). This subwatershed is entirely un-sewered. There are no stream water withdrawals in this subwatershed. Sampling data from site 38 is presented in Table 8.11 and TMDL allocations in Table 8.12.

Table 8.9 Jacks Creek RM 0.0 to 4.4 Information

|        | ,, , , , , , , ,  |           |          |           |                 |                | _       |       |          |
|--------|-------------------|-----------|----------|-----------|-----------------|----------------|---------|-------|----------|
| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order   |         |       |          |
| Sucam  | Segment           | W DID #   | County   | ACIES     | IVIIICS         | Siteatii Oldei |         |       |          |
|        | Jacks             |           |          |           |                 |                |         |       |          |
|        | Creek             |           |          |           |                 |                |         |       |          |
| Jacks  | 0.0 to            |           |          |           |                 |                |         |       |          |
| Creek  | 4.4               | 495089_01 | Floyd    | 3721.05   | 5.81            | 3rd order      |         |       |          |
|        |                   |           |          |           |                 |                |         | -     |          |
|        |                   |           | Sample   | Sample    |                 |                | + to    | from  | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF      | MAF     | MAF   | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination  | (cfs)   | (cfs) | (cfs)    |
| 38     | 38                | 0.1       | 37.36347 | -82.73338 | 8.1             | 0              | 0.00077 | 0     | 8.1008   |

Table 8.10 Jacks Creek RM 0.0 to 4.4 Subwatershed Land Cover

| Land Cover           | Watershed<br>Acres | Watershed<br>Square Miles | % of Total<br>Area | Future Growth WLA % |
|----------------------|--------------------|---------------------------|--------------------|---------------------|
| Open Water           | 0.00               | 0.00                      | 0.00               | 112270              |
| Developed            | 200.75             | 0.31                      | 5.39               | 1.0                 |
| Barren Land          | 40.24              | 0.06                      | 1.08               |                     |
| Forest               | 3187.95            | 4.98                      | 85.67              |                     |
| Grassland/Herbaceous | 257.88             | 0.40                      | 6.93               |                     |
| Pasture/Hay          | 32.46              | 0.05                      | 0.87               |                     |
| Cultivated Crops     | 1.56               | 0.00                      | 0.04               |                     |
| Wetlands             | 0.22               | 0.00                      | 0.01               |                     |
| Totals               | 3721.05            | 5.81                      | 100.00             |                     |

Table 8.11 Jacks Creek RM 0.0 to 4.4 Data (Site 38)

|                        | E asli                 | Elaw   | Instantaneous Load              | Unit Area Load                  |
|------------------------|------------------------|--------|---------------------------------|---------------------------------|
|                        | <u>E</u> . <u>coli</u> | Flow   | (billion <u>E</u> . <u>coli</u> | (million <u>E</u> . <u>coli</u> |
| Collection Date        | (colonies/100 mls)     | (cfs)  | colonies/day)                   | colonies/day/acre)              |
| 05/16/08               | 480                    | 2.623  | 30.80                           | 8.28                            |
| 05/30/08               | 700                    | 17.677 | 302.74                          | 81.36                           |
| 06/13/08               | 1000                   | 1.3287 | 32.51                           | 8.74                            |
| 06/27/08               | 3700                   | 1.027  | 92.97                           | 24.98                           |
| 07/11/08               | 450                    | 1.026  | 11.29                           | 3.03                            |
| 07/31/08               | 9000                   | 4.856  | 1069.25                         | 287.35                          |
| 08/08/08               | 520                    | 1.164  | 14.81                           | 3.98                            |
| 08/22/08               | 180                    | 0.714  | 3.14                            | 0.85                            |
| 09/12/08               | 1800                   | 2.853  | 125.64                          | 33.77                           |
| 09/20/08               | 560                    | 1.215  | 16.65                           | 4.47                            |
| 10/17/08               | 600                    | 0.642  | 9.42                            | 2.53                            |
| 10/17/08 (QA Sample)   | 800                    | N/A    | N/A                             | N/A                             |
| 10/24/08               | 90                     | 0.397  | 0.87                            | 0.23                            |
| 10/24/08 (QA Sample)   | 180                    | N/A    | N/A                             | N/A                             |
| Greatest Concentration | 9000                   |        |                                 |                                 |

Table 8.12 TMDL for Jacks Creek RM 0.0 to 4.4

| 14010 0.11    | E TIMBE TOT VU | CKS CICCK KIVI U               | .0 to 1.1                             | 1                           |   |  |
|---------------|----------------|--------------------------------|---------------------------------------|-----------------------------|---|--|
| TMDL<br>Table |                |                                |                                       |                             | E. <u>coli</u><br>(billion<br>colonies/day) |  |
|               |                |                                |                                       |                             | 1783.7241                                   | Existing<br>Load                       |
|               |                |                                |                                       |                             | 47.5660                                     | Total<br>TMDL                          |
|               |                |                                |                                       |                             | 4.7566                                      | MOS                                    |
|               |                |                                |                                       |                             | 42.8094                                     | TMDL<br>Target                         |
| AI<br>number  | KPDES#         | Discharger<br>Facility<br>Name | Туре                                  | Design<br>Capacity<br>(cfs) | 97.60                                       | % reduction                            |
| 4349          | KYG401133      | JONES<br>RESIDENCE             | Dwelling<br>Other than<br>Apartment   | 0.000774                    | 0.0045                                      | KPDES<br>WLA                           |
|               |                |                                | Addition<br>to MAF<br>(sum of<br>cfs) | 0.000774                    | 42.8048                                     | remainder                              |
|               |                |                                |                                       |                             | 0.4280                                      | Future<br>Growth<br>WLA <sup>(1)</sup> |
|               |                |                                |                                       |                             | 0.4325                                      | Total<br>WLA                           |
|               |                |                                |                                       |                             | 42.3768                                     | LA                                     |

Note: (1) Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

#### 8.4 Otter Creek RM 0.0 to 0.5

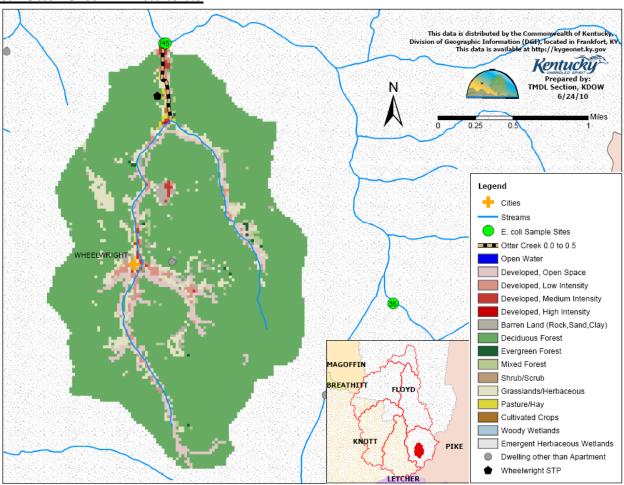


Figure 8.4 Otter Creek RM 0.0 to 0.5

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 37 is under site 45.

Otter Creek is a second order stream located in the Upper Left Fork Beaver Creek subwatershed in Floyd County (Figure 8.4). Information about Otter Creek, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.13. It has a catchment of 2,123 acres (3.3 square miles) with an 85% forested and 7.4% developed land cover (Table 8.14). This subwatershed is partially sewered around the city of Wheelwright (see Figure 8.5). There are no stream water withdrawals in this subwatershed. Sampling data from site 37 is presented in Table 8.15 and TMDL allocations in Table 8.16.

Table 8.13 Otter Creek RM 0.0 to 0.5 Information

|        | Stream  |              |          |           | Square |               |         |         |          |
|--------|---------|--------------|----------|-----------|--------|---------------|---------|---------|----------|
| Stream | Segment | WBID#        | County   | Acres     | Miles  | Stream Order  |         |         |          |
|        | Otter   |              |          |           |        |               |         |         |          |
|        | Creek   |              |          |           |        |               |         |         |          |
| Otter  | 0.0 to  |              |          |           |        |               |         |         |          |
| Creek  | 0.5     | KY500021_01  | Floyd    | 2123.24   | 3.32   | 2nd order     |         |         |          |
|        |         |              |          |           |        |               |         |         |          |
|        |         |              | Sample   | Sample    |        |               | + to    | - from  | Adjusted |
| EKU    | MAP     | Sample Point | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #  | RM           | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs)   | (cfs)    |
| 37     | 37      | 0.05         | 37.35389 | -82.71650 | 4.6    | 0             | 0.34890 | 0.00000 | 4.9489   |

Table 8.14 Otter Creek RM 0.0 to 0.5 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 0.00      | 0.00         | 0.00       |               |
| Developed            | 157.33    | 0.25         | 7.41       | 1.0           |
| Barren Land          | 29.55     | 0.05         | 1.39       |               |
| Forest/Shrubland     | 1807.92   | 2.82         | 85.15      |               |
| Grassland/Herbaceous | 122.66    | 0.19         | 5.78       |               |
| Pasture/Hay          | 4.89      | 0.01         | 0.23       |               |
| Cultivated Crops     | 0.67      | 0.00         | 0.03       |               |
| Wetlands             | 0.22      | 0.00         | 0.01       |               |
| Totals               | 2123.24   | 3.32         | 100.00     |               |

Table 8.15 Otter Creek RM 0.0 to 0.5 Data (Site 37)

| Collection Date           | E. coli<br>(colonies/100 mls) | Flow (cfs) | Instantaneous Load (billion <u>E</u> . <u>coli</u> colonies/day) | Unit Area Load (million <u>E</u> . <u>coli</u> colonies/day/acre) |
|---------------------------|-------------------------------|------------|--|---|
| 05/16/08                  | 6000                          | 1.461      | 214.47   | 101.01  |
| 05/30/08                  | 38000                         | 6.935      | 6447.46  | 3036.61   |
| 06/13/08                  | 2000                          | 1.1368     | 55.63  | 26.20   |
| 06/27/08                  | 490                           | 0.744      | 8.92   | 4.20  |
| 07/11/08                  | 2700                          | 1.787      | 118.04   | 55.60   |
| 07/31/08                  | >80000                        | 1.959      | 3834.27  | 1805.86   |
| 08/08/08                  | 730                           | 0.931      | 16.63  | 7.83  |
| 08/22/08                  | 570                           | 0.224      | 3.12   | 1.47  |
| 09/12/08                  | 2900                          | 0.875      | 62.08  | 29.24   |
| 09/20/08                  | >80000                        | 0.3732     | 730.45   | 344.03  |
| 10/17/08                  | 2400                          | 0.417      | 24.49  | 11.53   |
| 10/24/08                  | 250                           | 0.289      | 1.77   | 0.83  |
| Greatest<br>Concentration | 80000                         |            |  |   |

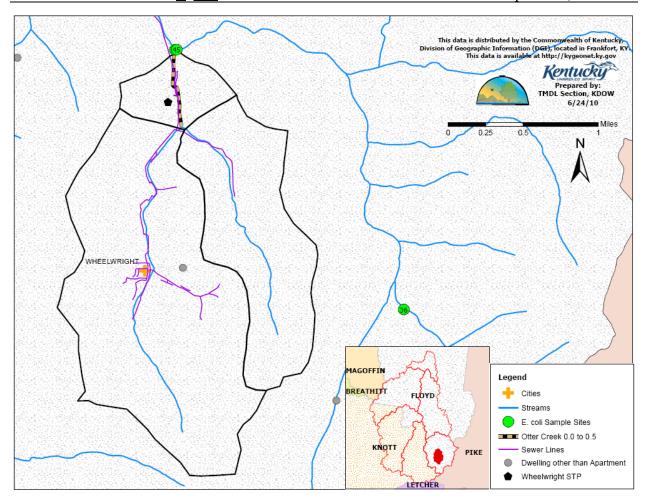


Figure 8.5 Sewer Lines in Otter Creek Subwatershed

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 37 is under site 45.

Table 8.16 TMDL for Otter Creek RM 0.0 to 0.5

| 1 4010 0.1   | O TWIDE IOI O | tiel Cleek Kivi 0.0 to      | 0.5                                   |                             |                                    |  |
|--------------|---------------|-----------------------------|---------------------------------------|-----------------------------|------------------------------------|--|
| TMDL         |               |                             |                                       |                             | <u>E</u> . <u>coli</u><br>(billion |  |
| Table        |               |                             |                                       |                             | colonies/day)                      |  |
|              |               |                             |                                       |                             | 0.000.007.0                        | Existing                               |
|              |               |                             |                                       |                             | 9686.2876                          | Load                                   |
|              |               |                             |                                       |                             | 29.0589                            | Total<br>TMDL                          |
|              |               |                             |                                       |                             | 2.9059                             | MOS                                    |
|              |               |                             |                                       |                             | 26.1530                            | TMDL<br>Target                         |
| AI<br>number | KPDES#        | Discharger<br>Facility Name | Туре                                  | Design<br>Capacity<br>(cfs) | 99.73                              | % reduction                            |
| 40534        | KY0028789     | WHEELWRIGHT<br>STP          | Sewerage<br>System                    | 0.348126525                 | 2.0441                             | KPDES<br>WLA                           |
| 44695        | KYG401580     | CAUDILL<br>RESIDENCE        | Dwelling<br>Other than<br>Apartment   | 0.000773615                 | 0.0045                             | KPDES<br>WLA                           |
|              |               |                             |                                       |                             | 2.0486                             | Total<br>KPDES<br>WLA                  |
|              |               |                             | Addition<br>to MAF<br>(sum of<br>cfs) | 0.34890014                  | 24.1043                            | remainder                              |
|              |               |                             | 7-10)                                 | 3,0 13,001                  | 0.2410                             | Future<br>Growth<br>WLA <sup>(1)</sup> |
|              |               |                             |                                       |                             | 2.2896                             | Total<br>WLA                           |
|              |               |                             |                                       |                             | 23.8633                            | LA                                     |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

#### 8.5 Left Fork Beaver Creek RM 18.7 to 28.6

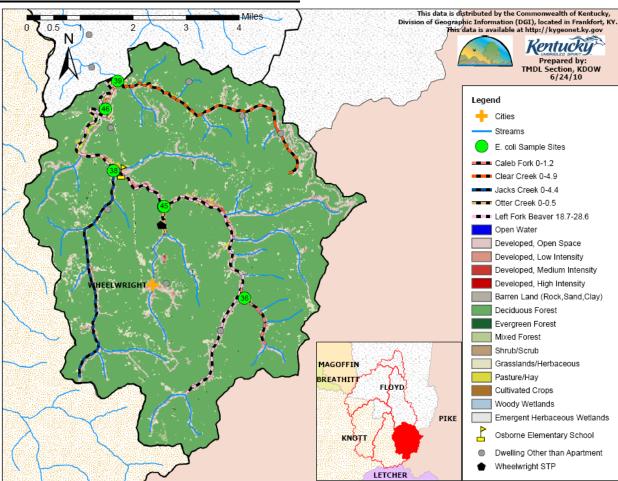


Figure 8.6 Left Fork Beaver Creek RM 18.7 to 28.6

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 37 is under site 45.

The Left Fork Beaver Creek at RM 18.7 is a fourth order stream located in Floyd County. Its subwatershed is identical to the Upper Left Fork Beaver Creek subwatershed (Figure 8.6). Information about this subwatershed, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.17. It has a catchment of 7,019 acres (11 square miles) with an 87% forested and 6.9% developed land cover (Table 8.18). Portions of this subwatershed are sewered around the city of Wheelwright (see Figure 5.18). There are no stream water withdrawals in this subwatershed. This segment had two sample sites and data from sites 45 and 46 is presented in Table 8.19. Because both sites had the same greatest concentration (>80,000), the downstream-most site (site 46) was used to set the TMDL. The TMDL calculations for site 45 are shown in Appendix E. The TMDL for Left Fork Beaver RM 18.7 to 28.6 (site 46) is shown in Table 8.20.

Table 8.17 Left Fork Beaver Creek RM 18.7 to 28.6 Information

| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |         |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|---------|----------|
|        | Left              |           |          |           |                 |               |         |         |          |
|        | Fork              |           |          |           |                 |               |         |         |          |
| Left   | Beaver            |           |          |           |                 |               |         |         |          |
| Fork   | Creek             |           |          |           |                 |               |         |         |          |
| Beaver | 18.7 to           |           |          |           |                 |               |         |         |          |
| Creek  | 28.6              | 496194_04 | Floyd    | 7019.46   | 10.97           | 4th order     |         |         |          |
|        |                   |           |          |           |                 |               |         |         |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from  | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 45     | 45                | 23.4      | 37.35390 | -82.71630 | 15.4            | 23.4          | 0.00077 | 0.00000 | 15.4008  |
| 46     | 46                | 19.6      | 37.38095 | 82.73524  | 35              | 18.7          | 0.38495 | 0.00000 | 35.3850  |

Table 8.18 Left Fork Beaver Creek RM 18.7 to 28.6 Subwatershed Land Cover

| Land Cover                             | Watershed<br>Acres | Watershed<br>Square<br>Miles | % of Total<br>Area | Future Growth WLA % |
|--|--------------------|------------------------------|--------------------|---------------------|
| Open Water                             | 0.00               | 0.00                         | 0.00               |                     |
| Developed                              | 482.05             | 0.75                         | 6.87               | 1.0                 |
| Barren Land                            | 59.62              | 0.09                         | 0.85               |                     |
| Forest/ Shrubland Grassland/Herbaceous | 6114.97            | 9.55<br>0.52                 | 87.11<br>4.73      |                     |
| Pasture/ Hay                           | 29.36              | 0.05                         | 0.42               |                     |
| Cultivated Crops Wetlands              | 0.89<br>0.22       | 0.00                         | 0.01               |                     |
| Totals                                 | 7019.46            | 10.97                        | 100.00             |                     |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

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Table 8.19 Left Fork Beaver Creek RM 18.7 to 28.6 Data (Sites 45 and 46)

| Site 45  | er ereen ravi re   | 3.7 to 20.0  | Data (Sites 45 and 46)  |   |
|--|--|--|---|---|
| DILC TJ  | E. coli  |  | Instantaneous Load  | Unit Area Load  |
|  | (colonies/100  | Flow   | (billion <u>E</u> . <u>coli</u>   | (million <u>E</u> . <u>coli</u>   |
| Collection Date  | mls)   | (cfs)  | colonies/day)   | colonies/day/acre)  |
| 05/16/08   | 3900   | 4.395  | 419.36  | 59.74   |
| 05/30/08   | 1400   | 21.576   | 739.02  | 105.28  |
| 06/13/08   | 2500   | 0.138  | 8.44  | 1.20  |
| 06/27/08   | 580  | 1.103  | 15.65   | 2.23  |
| 07/11/08   | 310  | 0.555  | 4.21  | 0.60  |
| 07/31/08   | >80000   | 5.316  | 10404.80  | 1482.28   |
| 08/08/08   | 740  | 0.689  | 12.47   | 1.78  |
| 08/22/08   | 600  | 0.508  | 7.46  | 1.06  |
| 09/12/08   | 30000  | 0.520  | 381.67  | 54.37   |
| 09/20/08   | 2000   | 0.158  | 7.73  | 1.10  |
| 10/17/08   | 6800   | 0.958  | 159.38  | 22.71   |
| 10/24/08   | 860  | 0.433  | 9.11  | 1.30  |
| 10/24/08 (QA Sample)   | 390  | N/A  | N/A   | N/A   |
| Greatest Concentration   | 80000  |  |   |   |
|  |  |  |   |   |
| Cita 16  |  |  |   |   |
| Site 46  |  |  |   |   |
| Site 40  | E. coli  | 771  | Instantaneous Load  | Unit Area Load  |
|  | (colonies/100  | Flow   | (billion <u>E</u> . <u>coli</u>   | (million <u>E</u> . <u>coli</u>   |
| Collection Date  | (colonies/100 mls)   | (cfs)  | (billion <u>E</u> . <u>coli</u><br>colonies/day)  | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)   |
| Collection Date 05/16/08   | (colonies/100 mls)   | (cfs)<br>8.799   | (billion <u>E</u> . <u>coli</u><br>colonies/day)<br>172.22  | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)<br>10.66  |
| Collection Date 05/16/08 05/30/08  | (colonies/100 mls)<br>800<br>290   | (cfs)<br>8.799<br>72.576   | (billion <u>E</u> . <u>coli</u><br>colonies/day)<br>172.22<br>514.93  | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)<br>10.66<br>31.86   |
| Collection Date 05/16/08 05/30/08 06/13/08   | (colonies/100 mls)  800  290  130  | (cfs)<br>8.799<br>72.576<br>5.353  | (billion <u>E</u> . <u>coli</u> colonies/day)  172.22  514.93  17.03  | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)<br>10.66<br>31.86<br>1.05   |
| Collection Date 05/16/08 05/30/08 06/13/08 06/27/08  | (colonies/100 mls)  800  290  130  90  | (cfs)<br>8.799<br>72.576<br>5.353<br>2.727   | (billion <u>E</u> . <u>coli</u> <u>colonies/day)</u> 172.22  514.93  17.03  6.00  | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)<br>10.66<br>31.86<br>1.05<br>0.37   |
| Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  | (colonies/100 mls)  800  290  130  90  130                                       | (cfs)<br>8.799<br>72.576<br>5.353<br>2.727<br>3.555  | (billion <u>E</u> . <u>coli</u> <u>colonies/day)</u> 172.22  514.93  17.03  6.00  11.31   | (million <u>E</u> . <u>coli</u> <u>colonies/day/acre</u> )  10.66  31.86  1.05  0.37  0.70  |
| Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08  | (colonies/100 mls)  800  290  130  90  130  >80000                               | (cfs)<br>8.799<br>72.576<br>5.353<br>2.727<br>3.555<br>23.673  | (billion <u>E</u> . <u>coli</u> colonies/day)  172.22  514.93  17.03  6.00  11.31  46334.23   | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)<br>10.66<br>31.86<br>1.05<br>0.37<br>0.70<br>2867.24                            |
| Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08 (QA Sample)  | (colonies/100 mls)  800  290  130  90  130  >80000  17000                        | (cfs)<br>8.799<br>72.576<br>5.353<br>2.727<br>3.555<br>23.673<br>N/A   | (billion <u>E</u> . <u>coli</u> colonies/day)  172.22  514.93  17.03  6.00  11.31  46334.23  N/A                                      | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)<br>10.66<br>31.86<br>1.05<br>0.37<br>0.70<br>2867.24<br>N/A                     |
| Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08  7/31/08 (QA Sample)  08/08/08   | (colonies/100 mls)  800  290  130  90  130  >80000  17000  170                   | (cfs)<br>8.799<br>72.576<br>5.353<br>2.727<br>3.555<br>23.673<br>N/A<br>4.089                                    | (billion <u>E</u> . <u>coli</u> colonies/day)  172.22  514.93  17.03  6.00  11.31  46334.23  N/A  17.01                               | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)<br>10.66<br>31.86<br>1.05<br>0.37<br>0.70<br>2867.24<br>N/A<br>1.05             |
| Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08 (QA Sample)  08/08/08  08/22/08  | (colonies/100 mls)  800  290  130  90  130  >80000  17000  170  30               | (cfs)<br>8.799<br>72.576<br>5.353<br>2.727<br>3.555<br>23.673<br>N/A<br>4.089<br>1.406                           | (billion <u>E</u> . <u>coli</u> colonies/day)  172.22  514.93  17.03  6.00  11.31  46334.23  N/A  17.01  1.03                         | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)<br>10.66<br>31.86<br>1.05<br>0.37<br>0.70<br>2867.24<br>N/A<br>1.05<br>0.06     |
| Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08 (QA Sample)  08/08/08  08/22/08  09/12/08                                | (colonies/100 mls)  800  290  130  90  130  >80000  17000  170  30  1100         | (cfs)<br>8.799<br>72.576<br>5.353<br>2.727<br>3.555<br>23.673<br>N/A<br>4.089<br>1.406<br>3.633                  | (billion <u>E</u> . <u>coli</u> <u>colonies/day)</u> 172.22  514.93  17.03  6.00  11.31  46334.23  N/A  17.01  1.03  97.77            | (million <u>E</u> . <u>coli</u> <u>colonies/day/acre</u> )  10.66  31.86  1.05  0.37  0.70  2867.24  N/A  1.05  0.06  6.05            |
| Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08 (QA Sample)  08/08/08  08/22/08  09/12/08  09/20/08                      | (colonies/100 mls)  800  290  130  90  130  >80000  17000  170  30  1100  30     | (cfs) 8.799 72.576 5.353 2.727 3.555 23.673 N/A 4.089 1.406 3.633 1.2618   | (billion <u>E</u> . <u>coli</u> colonies/day)  172.22  514.93  17.03  6.00  11.31  46334.23  N/A  17.01  1.03  97.77  0.93            | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)  10.66  31.86  1.05  0.37  0.70  2867.24  N/A  1.05  0.06  6.05  0.06           |
| Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08 (QA Sample)  08/08/08  08/22/08  09/12/08  09/20/08  9/20/08 (QA Sample) | (colonies/100 mls)  800  290  130  90  130  >80000  17000  170  30  1100  30  50 | (cfs)<br>8.799<br>72.576<br>5.353<br>2.727<br>3.555<br>23.673<br>N/A<br>4.089<br>1.406<br>3.633<br>1.2618<br>N/A | (billion <u>E</u> . <u>coli</u> <u>colonies/day)</u> 172.22  514.93  17.03  6.00  11.31  46334.23  N/A  17.01  1.03  97.77  0.93  N/A | (million <u>E</u> . <u>coli</u> <u>colonies/day/acre</u> )  10.66  31.86  1.05  0.37  0.70  2867.24  N/A  1.05  0.06  6.05  0.06  N/A |
| Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08 (QA Sample)  08/08/08  08/22/08  09/12/08  09/20/08                      | (colonies/100 mls)  800  290  130  90  130  >80000  17000  170  30  1100  30     | (cfs) 8.799 72.576 5.353 2.727 3.555 23.673 N/A 4.089 1.406 3.633 1.2618   | (billion <u>E</u> . <u>coli</u> colonies/day)  172.22  514.93  17.03  6.00  11.31  46334.23  N/A  17.01  1.03  97.77  0.93            | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)  10.66  31.86  1.05  0.37  0.70  2867.24  N/A  1.05  0.06  6.05  0.06           |

Table 8.20 TMDL for Left Fork Beaver Creek RM 18.7 to 28.6

| 14010 0.20 1  | TOT BOTT   | OIR Beaver Creek I         | 10.7 to 20.0   | 1         |                        |                     |
|---------------|------------|----------------------------|----------------|-----------|------------------------|---------------------|
| TI (D)        |            |                            |                |           | E. coli                |                     |
| TMDL<br>Table |            |                            |                |           | (billion colonies/day) |                     |
| Table         |            |                            |                |           | colonies/day)          | Existing            |
| Site 46       |            |                            |                |           | 69257.5721             | Load                |
|               |            |                            |                |           |                        | Total               |
|               |            |                            |                |           | 207.7727               | TMDL                |
|               |            |                            |                |           | 20.7773                | MOS                 |
|               |            |                            |                |           | 20.7775                |                     |
|               |            |                            |                |           | 186.9954               | TMDL                |
|               |            |                            |                | Design    | 180.9934               | Target              |
|               |            | Discharger                 |                | Capacity  |                        | %                   |
| AI number     | KPDES#     | Facility Name              | Туре           | (cfs)     | 99.73                  | reduction           |
|               |            | WHEELWRIGHT                | Sewerage       |           |                        | KPDES               |
| 40534         | KY0028789  | STP                        | System         | 0.3481265 | 2.0441                 | WLA                 |
|               |            | OSBORNE                    | j              |           |                        | KPDES               |
| 35251         | KY0089435  | ELEM SCHOOL                | School         | 0.0105212 | 0.0618                 | WLA                 |
| 33231         | 1210007133 |                            | Senioor        | 0.0103212 | 0.0010                 |                     |
| 35260         | KY0093912  | SOUTH FLOYD<br>HIGH SCHOOL | School         | 0.0232084 | 0.1363                 | KPDES<br>WLA        |
| 33200         | K10093912  |                            |                | 0.0232084 | 0.1303                 |                     |
| 42.40         | WWG401122  | JONES                      | Dwelling Other | 0.0007726 | 0.0045                 | KPDES               |
| 4349          | KYG401133  | RESIDENCE                  | than Apartment | 0.0007736 | 0.0045                 | WLA                 |
|               |            | TACKETT                    | Dwelling Other |           |                        | KPDES               |
| 74181         | KYG401470  | RESIDENCE                  | than Apartment | 0.0007736 | 0.0045                 | WLA                 |
|               |            | CAUDILL                    | Dwelling Other |           |                        | KPDES               |
| 44695         | KYG401580  | RESIDENCE                  | than Apartment | 0.0007736 | 0.0045                 | WLA                 |
|               |            | COCHRAN                    | Dwelling Other |           |                        | KPDES               |
| 48897         | KYG401646  | RESIDENCE                  | than Apartment | 0.0007736 | 0.0045                 | WLA                 |
|               |            |                            |                |           |                        | Total               |
|               |            |                            |                |           |                        | KPDES               |
|               |            |                            |                |           | 2.2603                 | WLA                 |
|               |            |                            | Addition to    |           |                        |                     |
|               |            |                            | MAF (sum of    | 0.2040506 | 104.7351               | . 1                 |
|               |            |                            | cfs)           | 0.3849506 | 184.7351               | remainder<br>Future |
|               |            |                            |                |           |                        | Growth              |
|               |            |                            |                |           | 1.8474                 | WLA (1)             |
|               |            |                            |                |           | 1.04/4                 | Total               |
|               |            |                            |                |           | 4.1077                 | WLA                 |
|               |            |                            |                |           | 182.8877               | LA                  |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

#### 8.6 Frasure Creek RM 0.0 to 5.2

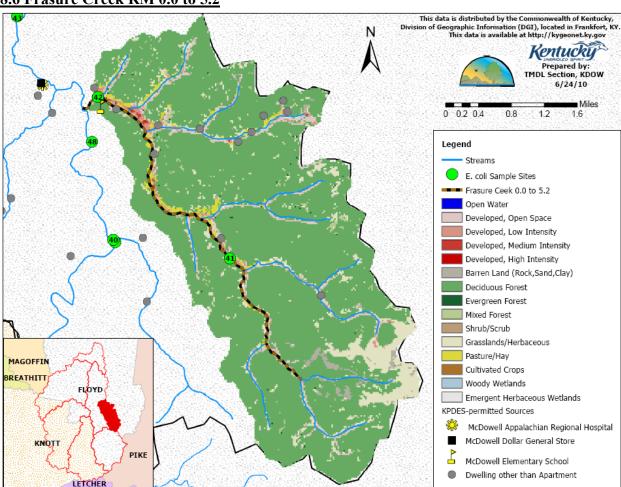


Figure 8.7 Frasure Creek RM 0.0 to 5.2

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 47 is under site 40.

Frasure Creek is a third order stream located in the Lower Left Fork Beaver Creek subwatershed in Floyd County (Figure 8.7). Information about Frasure Creek, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.21. It has a catchment of 7,360 acres (11.5 square miles) with an 83% forested and 5.1% developed land cover (Table 8.22). This subwatershed is entirely un-sewered. There are no stream water withdrawals in this subwatershed. This segment had two sample sites and data from sites 41 and 42 is presented in Table 8.23. Site 41 had the greatest concentration (71,000) so this concentration was used to set the existing loads and percent reduction for the impaired segment. However, to extrapolate to the end of the impaired segment, the Adjusted MAF from site 42 (15.6325 cfs) was used as the flow to set the TMDL for this impaired segment. The TMDL calculations for site 41 and 42 are shown in Appendix E while the TMDL for Frasure Creek RM 0.0 to 5.2 is shown in Table 8.24.

Table 8.21 Frasure Creek RM 0.0 to 5.2 Subwatershed Information

| Cturren | Stream  | WIDID #   | Commen   | A         | Square | C4            |         |         |          |
|---------|---------|-----------|----------|-----------|--------|---------------|---------|---------|----------|
| Stream  | Segment | WBID#     | County   | Acres     | Miles  | Stream Order  |         |         |          |
|         | Frasure |           |          |           |        |               |         |         |          |
|         | Creek   |           |          |           |        |               |         |         |          |
| Frasure | 0.0 to  |           |          |           |        |               |         |         |          |
| Creek   | 5.2     | 492466_01 | Floyd    | 3494.33   | 5.46   | 3rd order     |         |         |          |
|         |         |           | Sample   | Sample    |        |               | + to    | - from  | Adjusted |
| EKU     | MAP     | Sample    | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF     | MAF      |
| Site #  | Site #  | Point RM  | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs)   | (cfs)    |
| 41      | 41      | 3.25      | 37.42650 | -82.70880 | 7.6    | 3.25          | 0.00077 | 0.00000 | 7.6008   |
| 42      | 42      | 0.25      | 37.45560 | -82.73680 | 15.6   | 0             | 0.03249 | 0.00000 | 15.6325  |

Table 8.22 Frasure Creek RM 0.0 to 5.2 Subwatershed Land Cover

| Land Cover           | Watershed<br>Acres | Watershed<br>Square Miles | % of Total<br>Area | Future Growth WLA % |
|----------------------|--------------------|---------------------------|--------------------|---------------------|
| Open Water           | 0.00               | 0.00                      | 0.00               |                     |
| Developed            | 376.21             | 0.59                      | 5.11               | 1.0 (1)             |
| Barren Land          | 115.46             | 0.18                      | 1.57               |                     |
| Forest/Shrubland     | 6099.62            | 9.53                      | 82.87              |                     |
| Grassland/Herbaceous | 611.81             | 0.96                      | 8.31               |                     |
| Pasture/ Hay         | 151.51             | 0.24                      | 2.06               |                     |
| Cultivated Crops     | 5.56               | 0.01                      | 0.08               |                     |
| Wetlands             | 0.00               | 0.00                      | 0.00               |                     |
| Totals               | 7360.17            | 11.50                     | 100.00             |                     |

<sup>&</sup>lt;sup>(1)</sup> Note: The subwatershed upstream of Site 41 had 3.4% of its total area in the developed land cover category so 0.5% was used to determine the Future Growth WLA in the TMDL calculations for Site 41.

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Table 8.23 Frasure Creek RM 0.0 to 5.2 Data (Sites 41 and 42)

| Site 41  | R RIVI 0.0 to 3.2                                  | Data (Sites 11 aii                                      | u 12)   |  |
|--|--|---|---|--|
| Site 11  | E. coli  |   | Instantaneous Load                                    | Unit Area Load                                     |
|  | (colonies/100                                      |   | (billion <u>E</u> . <u>coli</u>                       | (million <u>E</u> . <u>coli</u>                    |
| Collection Date  | mls)   | Flow (cfs)  | colonies/day)   | colonies/day/acre)                                 |
| 05/16/08   | 2000   | N/A   | N/A   | N/A  |
| 05/30/08   | 1600   | 0.9202  | 36.02   | 10.31  |
| 06/13/08   | 170  | 0.3155  | 1.31  | 0.38   |
| 06/27/08   | 450  | 0.29  | 3.19  | 0.91   |
| 07/31/08   | 71000  | 18.8592   | 0.00  | 0.00   |
| 08/08/08   | 1700   | 0.474   | 32759.73  | 9375.11  |
| 8/8/08 (QA Sample)   | 360  | N/A   | 19.71   | 5.64   |
| 09/12/08   | 13000  | 0.7636  | N/A   | N/A  |
| 09/20/08   | 1000   | 0.391   | 242.87  | 69.50  |
| Greatest   | (1)  |   |   |  |
| Concentration  | 71000 (1)  |   | 9.57  | 2.74   |
| 0 10   |  |   |   |  |
| Site 42  |  |   |   |  |
|  | E. coli  |   | Instantaneous Load                                    | Unit Area Load                                     |
| C 11 4 D 4   | (colonies/100                                      | E1 ( C)   | (billion <u>E</u> . <u>coli</u>                       | (million <u>E</u> . <u>coli</u>                    |
| Collection Date  | mls)   | Flow (cfs)  | colonies/day)   | colonies/day/acre)                                 |
| 05/16/08   | 160  | N/A   | N/A   | N/A  |
| 05/30/08   | 400  | 1.3342  | 13.06   | 1.77   |
| 06/13/08   | 570  | 6.321   | 88.15   | 11.98  |
| 06/27/08   | 560  | 0.8631  | 11.83   | 1.61   |
| 07/31/08   |  |   | ~ ~ / .   | ~ ~ / .  |
| 0.0.10.0.10.0  | 43000  | N/A   | N/A   | N/A  |
| 08/08/08   | 440  | 0.588   | 6.33  | 0.86   |
| 08/22/08   | 440<br>900   | 0.588<br>0.116  | 6.33<br>2.55  | 0.86<br>0.35                                       |
| 08/22/08<br>8/22/08 (QA Sample)  | 440<br>900<br>1100                                 | 0.588<br>0.116<br>N/A                                   | 6.33<br>2.55<br>N/A                                   | 0.86<br>0.35<br>N/A                                |
| 08/22/08<br>8/22/08 (QA Sample)<br>09/12/08  | 440<br>900<br>1100<br>3300                         | 0.588<br>0.116<br>N/A<br>0.709                          | 6.33<br>2.55<br>N/A<br>57.24                          | 0.86<br>0.35<br>N/A<br>7.78                        |
| 08/22/08<br>8/22/08 (QA Sample)<br>09/12/08<br>9/12/08 (QA Sample)                                     | 440<br>900<br>1100<br>3300<br>3600                 | 0.588<br>0.116<br>N/A<br>0.709<br>N/A                   | 6.33<br>2.55<br>N/A<br>57.24<br>N/A                   | 0.86<br>0.35<br>N/A<br>7.78<br>N/A                 |
| 08/22/08<br>8/22/08 (QA Sample)<br>09/12/08<br>9/12/08 (QA Sample)<br>09/20/08                         | 440<br>900<br>1100<br>3300<br>3600<br>1900         | 0.588<br>0.116<br>N/A<br>0.709                          | 6.33<br>2.55<br>N/A<br>57.24                          | 0.86<br>0.35<br>N/A<br>7.78                        |
| 08/22/08<br>8/22/08 (QA Sample)<br>09/12/08<br>9/12/08 (QA Sample)<br>09/20/08<br>10/17/08             | 440<br>900<br>1100<br>3300<br>3600                 | 0.588<br>0.116<br>N/A<br>0.709<br>N/A<br>0.256<br>0.476 | 6.33<br>2.55<br>N/A<br>57.24<br>N/A                   | 0.86<br>0.35<br>N/A<br>7.78<br>N/A                 |
| 08/22/08<br>8/22/08 (QA Sample)<br>09/12/08<br>9/12/08 (QA Sample)<br>09/20/08<br>10/17/08<br>10/24/08 | 440<br>900<br>1100<br>3300<br>3600<br>1900         | 0.588<br>0.116<br>N/A<br>0.709<br>N/A<br>0.256          | 6.33<br>2.55<br>N/A<br>57.24<br>N/A<br>11.90          | 0.86<br>0.35<br>N/A<br>7.78<br>N/A<br>1.62         |
| 08/22/08<br>8/22/08 (QA Sample)<br>09/12/08<br>9/12/08 (QA Sample)<br>09/20/08<br>10/17/08             | 440<br>900<br>1100<br>3300<br>3600<br>1900<br>3200 | 0.588<br>0.116<br>N/A<br>0.709<br>N/A<br>0.256<br>0.476 | 6.33<br>2.55<br>N/A<br>57.24<br>N/A<br>11.90<br>37.27 | 0.86<br>0.35<br>N/A<br>7.78<br>N/A<br>1.62<br>5.06 |

Note: (1) Indicates concentration used to set existing load and percent reduction for impaired segment.

Table 8.24 TMDL for Frasure Creek RM 0.0 to 5.2

| Table 8.2               | 4 TMDL for Fr                       | asure Creek RM 0.0  | ) to 5.2  |                                     |                            |   |
|-------------------------|-------------------------------------|---|---|-------------------------------------|----------------------------|---|
|                         |                                     |   |   |                                     | <u>E</u> . <u>coli</u>     |   |
| TMDL                    |                                     |   |   |                                     | (billion                   |   |
| Table                   |                                     |   |   |                                     | colonies/day)              |   |
|                         |                                     |   |   |                                     | 3,                         | Existing                                      |
|                         |                                     |   |   |                                     | 27154.7145                 | Load  |
|                         |                                     |   |   |                                     |                            | Total   |
|                         |                                     |   |   |                                     | 91.7906                    | TMDL  |
|                         |                                     |   |   |                                     | 9.1791                     | MOS   |
|                         |                                     |   |   |                                     |                            | TMDL  |
|                         |                                     |   |   |                                     | 82.6115                    | Target  |
|                         |                                     |   |   | Design                              |                            |   |
| AI                      |                                     | Discharger  |   | Capacity                            |                            | %   |
| number                  | KPDES#                              | Facility Name   | Type  | (cfs)                               | 99.70                      | reduction                                     |
|                         |                                     | MCDOWELL  | Jr -  | (- 12)                              |                            |   |
|                         |                                     | ELEM  |   |                                     |                            | KPDES -                                       |
| 35252                   | KY0079421                           | SCHOOL  | School  | 0.0232084                           | 0.1363                     | WLA   |
|                         |                                     |   | Dwelling  |                                     |                            |   |
|                         |                                     | MITCHELL  | Other than  |                                     |                            | KPDES   |
| 1269                    | KYG400478                           | RESIDENCE   | Apartment   | 0.0007736                           | 0.0045                     | WLA   |
|                         |                                     |   | Dwelling  |                                     |                            |   |
|                         |                                     | STUMBO  | Other than  |                                     |                            | KPDES   |
| 1327                    | KYG400601                           | RESIDENCE   | Apartment   | 0.0007736                           | 0.0045                     | WLA   |
|                         |                                     |   | Dwelling  |                                     | 00000                      | ,,  |
|                         |                                     | DYE   | Other than  |                                     |                            | KPDES   |
| 1182                    | KYG400614                           | RESIDENCE   | Apartment   | 0.0007736                           | 0.0045                     | WLA   |
| 1102                    | 111010011                           | TESTE ET (CE  | Dwelling  | 0.0007720                           | 000010                     | , , , <u>, , , , , , , , , , , , , , , , </u> |
|                         |                                     | HALL  | Other than  |                                     |                            | KPDES   |
| 1202                    | KYG400969                           | RESIDENCE   | Apartment   | 0.0007736                           | 0.0045                     | WLA   |
|                         |                                     |   | Dwelling  |                                     |                            |   |
|                         |                                     | HOWELL  | Other than  |                                     |                            | KPDES   |
| 4356                    | KYG401040                           | RESIDENCE   | Apartment   | 0.0007736                           | 0.0045                     | WLA   |
|                         |                                     |   | Dwelling  |                                     |                            |   |
|                         |                                     | MOORE   | Other than  |                                     |                            | KPDES   |
| 35887                   | KYG401533                           |   |   | 0.0007736                           | 0.0045                     |   |
|                         |                                     |   |   | 3.000,700                           |                            | .,  |
|                         |                                     | BLANKENSHIP   | _   |                                     |                            | KPDES   |
| 50021                   | KYG401692                           |   |   | 0.0007736                           | 0.0045                     |   |
| 0.021                   | 11101010                            | TELESTE ST. (CE   |   | 3.0037720                           | 0.0010                     | ,, 231  |
|                         |                                     | NEWMAN  |   |                                     |                            | KPDES   |
| 71436                   | KYG401809                           |   |   | 0.0007736                           | 0.0045                     |   |
| , , , , , ,             |                                     |   |   | 3.000,700                           | 0.0010                     | ,, 231  |
|                         |                                     | COMBS   |   |                                     |                            | KPDES   |
| 74243                   | KYG401821                           |   |   | 0.0007736                           | 0.0045                     |   |
| 35887<br>50021<br>71436 | KYG401533<br>KYG401692<br>KYG401809 | RESIDENCE  BLANKENSHIP RESIDENCE  NEWMAN RESIDENCE  COMBS RESIDENCE | Apartment Dwelling Other than Apartment Dwelling Other than Apartment Dwelling Other than Apartment Dwelling Other than Apartment | 0.0007736<br>0.0007736<br>0.0007736 | 0.0045<br>0.0045<br>0.0045 | KPDES WLA  KPDES WLA  KPDES WLA  KPDES WLA    |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

September, 2010

|        |           |               |            | Design    | E. coli       |                    |
|--------|-----------|---------------|------------|-----------|---------------|--------------------|
| AI     |           | Discharger    |            | Capacity  | (billion      |                    |
| number | KPDES#    | Facility Name | Type       | (cfs)     | colonies/day) |                    |
|        |           |               | Dwelling   |           |               |                    |
|        |           | HARVEL        | Other than |           |               | KPDES              |
| 79525  | KYG401931 | RESIDENCE     | Apartment  | 0.0007736 | 0.0045        | WLA                |
|        |           |               | Dwelling   |           |               |                    |
|        |           | MARTIN        | Other than |           |               | KPDES              |
| 81193  | KYG401970 | RESIDENCE     | Apartment  | 0.0007736 | 0.0045        | WLA                |
|        |           |               | Dwelling   |           |               |                    |
|        |           | LITTLE        | Other than |           |               | KPDES              |
| 103052 | KYG402117 | RESIDENCE     | Apartment  | 0.0007736 | 0.0045        | WLA                |
|        |           |               |            |           |               | Total              |
|        |           |               |            |           |               | KPDES              |
|        |           |               |            |           | 0.1908        | WLA                |
|        |           |               | Addition   |           |               |                    |
|        |           |               | to MAF     |           |               |                    |
|        |           |               | (sum of    |           |               |                    |
|        |           |               | cfs)       | 0.0324918 | 82.4207       | remainder          |
|        |           |               |            |           |               | Future             |
|        |           |               |            |           |               | Growth             |
|        |           |               |            |           | 0.8242        | WLA <sup>(1)</sup> |
|        |           |               |            |           |               | Total              |
|        |           |               |            |           | 1.0150        | WLA                |
|        |           |               |            |           | 81.5965       | LA                 |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

#### 8.7 Simpson Branch RM 0.0 to 1.8

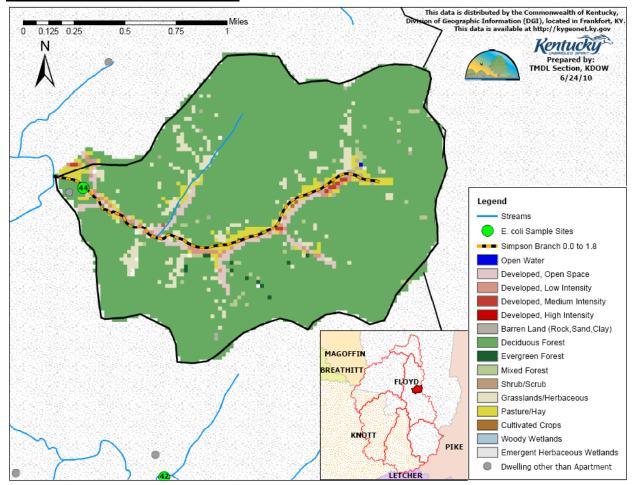


Figure 8.8 Simpson Branch RM 0.0 to 1.8

Simpson Branch is a second order stream located in the Lower Left Fork Beaver Creek subwatershed in Floyd County (Figure 8.8). Information about Simpson Branch, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.25. It has a catchment of 1,259 acres (2 square miles) with an 88% forested and 3.6% developed land cover (Table 8.26). This subwatershed is entirely un-sewered. There are no stream water withdrawals in this subwatershed. Sampling data from site 44 is presented in Table 8.27 and TMDL allocations in Table 8.28.

Table 8.25 Simpson Branch RM 0.0 to 1.8 Information

| 1 4010 0.2 |         |           |          |           |        |               | 1       |         |          |
|------------|---------|-----------|----------|-----------|--------|---------------|---------|---------|----------|
|            | Stream  |           |          |           | Square |               |         |         |          |
| Stream     | Segment | WBID#     | County   | Acres     | Miles  | Stream Order  |         |         |          |
|            | Simpson |           |          |           |        |               |         |         |          |
|            | Branch  |           |          |           |        |               |         |         |          |
| Simpson    | 0.0 to  |           |          |           |        |               |         |         |          |
| Branch     | 1.8     | 503532_01 | Floyd    | 1258.93   | 1.97   | 2nd order     |         |         |          |
|            |         |           |          |           |        |               |         |         |          |
|            |         |           | Sample   | Sample    |        |               | + to    | - from  | Adjusted |
| EKU        | MAP     | Sample    | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF     | MAF      |
| Site #     | Site #  | Point RM  | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs)   | (cfs)    |
| 44         | 44      | 0.2       | 37.47600 | -82.74252 | 2.6    | 0             | 0.00077 | 0.00000 | 2.6008   |

Table 8.26 Simpson Branch RM 0.0 to 1.8 Subwatershed Land Cover

| Land Cover           | Watershed<br>Acres | Watershed<br>Square Miles | % of Total<br>Area | Future Growth WLA % |
|----------------------|--------------------|---------------------------|--------------------|---------------------|
| Open Water           | 0.22               | 0.00                      | 0.02               |                     |
| Developed            | 44.84              | 0.07                      | 3.56               | 0.5                 |
| Barren Land          | 5.77               | 0.01                      | 0.46               |                     |
| Forest/Shrubland     | 1110.64            | 1.74                      | 88.22              |                     |
| Grassland/Herbaceous | 55.72              | 0.09                      | 4.43               |                     |
| Pasture/Hay          | 40.40              | 0.06                      | 3.21               |                     |
| Cultivated Crops     | 1.33               | 0.00                      | 0.11               |                     |
| Wetlands             | 0.00               | 0.00                      | 0.00               |                     |
| Totals               | 1258.93            | 1.97                      | 100.00             |                     |

Table 8.27 Simpson Branch RM 0.0 to 1.8 Data (Site 44)

|                           | E. coli<br>(colonies/100 | Flow   | Instantaneous<br>Load (billion <u>E</u> . | Unit Area Load (million <u>E</u> . coli |
|---------------------------|--------------------------|--------|---|---|
| Collection Date           | mls)                     | (cfs)  | <u>coli</u> colonies/day)                 | colonies/day/acre)                      |
| 05/16/08                  | 30                       | N/A    | N/A                                       | N/A                                     |
| 05/30/08                  | 40                       | 0.2607 | 0.26                                      | 0.20                                    |
| 06/13/08                  | 100                      | 0.9723 | 2.38                                      | 1.89                                    |
| 07/31/08                  | 54000                    | N/A    | N/A                                       | N/A                                     |
| 08/08/08                  | 210                      | 0.058  | 0.30                                      | 0.24                                    |
| 08/22/08                  | 40                       | N/A    | N/A                                       | N/A                                     |
| 09/12/08                  | 440                      | 0.0624 | 0.67                                      | 0.53                                    |
| 09/20/08                  | 160                      | 0.077  | 0.30                                      | 0.24                                    |
| 10/24/08                  | 1500                     | 0.0465 | 1.71                                      | 1.36                                    |
| Greatest<br>Concentration | 54000                    |        |   |   |

Table 8.28 TMDL for Simpson Branch RM 0.0 to 1.8

| 1 4010 0.2    | O TIVIDE TOT DI | inpson Branch Kivi      | 0.0 to 1.0                          |                    |                            |  |
|---------------|-----------------|-------------------------|-------------------------------------|--------------------|----------------------------|--|
|               |                 |                         |                                     |                    | E. <u>coli</u><br>(billion |  |
| TMDL<br>Table |                 |                         |                                     |                    | colonies/<br>day)          |  |
|               |                 |                         |                                     |                    | 3436.0145                  | Existing<br>Load                       |
|               |                 |                         |                                     |                    | 15.2712                    | Total<br>TMDL                          |
|               |                 |                         |                                     |                    | 1.5271                     | MOS                                    |
|               |                 |                         |                                     |                    | 12 7441                    | TMDL                                   |
|               |                 |                         |                                     |                    | 13.7441                    | Target                                 |
| AI            |                 | Discharger              |                                     | Design<br>Capacity |                            | %                                      |
| number        | KPDES#          | Facility Name           | Туре                                | (cfs)              | 99.60                      | reduction                              |
| 74022         | KYG401406       | WILLIAMSON<br>RESIDENCE | Dwelling<br>Other than<br>Apartment | 0.0007736          | 0.0045                     | KPDES<br>WLA                           |
|               |                 |                         | Addition<br>to MAF                  |                    |                            |  |
|               |                 |                         | (sum of                             |                    |                            |  |
|               |                 |                         | cfs)                                | 0.0007736          | 13.7395                    | remainder                              |
|               |                 |                         |                                     |                    | 0.0687                     | Future<br>Growth<br>WLA <sup>(1)</sup> |
|               |                 |                         |                                     |                    | 0.0732                     | Total<br>WLA                           |
|               |                 |                         |                                     |                    | 13.6708                    | LA                                     |

Note:  $^{(1)}$  Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

#### 8.8 Spurlock Creek RM 0.0 to 0.6

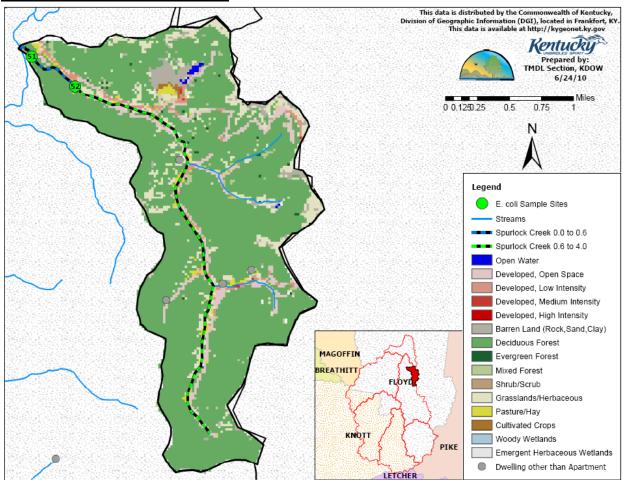


Figure 8.9 Spurlock Creek RM 0.0 to 0.6

Spurlock Creek is a third order stream located in the Lower Left Fork Beaver Creek subwatershed in Floyd County (Figure 8.9). Information about Spurlock Creek, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.29. It has a catchment of 2,468 acres (3.9 square miles) with a 79% forested and 7.6% developed land cover (Table 8.30). This subwatershed is entirely un-sewered. Note that the upper portion of this subwatershed (above RM 0.6) has a fully supporting segment (see information for fully supporting segments in Appendix F). There are no stream water withdrawals in this subwatershed. Sampling data from site 51 is presented in Table 8.31 and TMDL allocations in Table 8.32.

Table 8.29 Spurlock Creek RM 0.0 to 0.6 Information

|          | Stream   |           |          |           | Square |               |         |         |          |
|----------|----------|-----------|----------|-----------|--------|---------------|---------|---------|----------|
| Stream   | Segment  | WBID#     | County   | Acres     | Miles  | Stream Order  |         |         |          |
|          | Spurlock |           |          |           |        |               |         |         |          |
|          | Creek    |           |          |           |        |               |         |         |          |
| Spurlock | 0.0 to   |           |          |           |        |               |         |         |          |
| Creek    | 0.6      | 504191_01 | Floyd    | 2468.29   | 3.86   | 3rd order     |         |         |          |
|          |          |           | Sample   | Sample    |        |               | + to    | - from  | Adjusted |
| EKU      | MAP      | Sample    | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF     | MAF      |
| Site #   | Site #   | Point RM  | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs)   | (cfs)    |
| 51       | 51       | 0.1       | 37.53080 | -82.74220 | 5.1    | 0             | 0.00309 | 0.00000 | 5.1031   |

Table 8.30 Spurlock Creek RM 0.0 to 0.6 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 5.11      | 0.01         | 0.21       |               |
| Developed            | 188.64    | 0.29         | 7.64       | 1.0           |
| Barren Land          | 67.32     | 0.11         | 2.73       |               |
| Forest/Shrubland     | 1945.26   | 3.04         | 78.81      |               |
| Grassland/Herbaceous | 217.52    | 0.34         | 8.81       |               |
| Pasture/Hay          | 39.55     | 0.06         | 1.60       |               |
| Cultivated Crops     | 4.67      | 0.01         | 0.19       |               |
| Wetlands             | 0.22      | 0.00         | 0.01       |               |
| Totals               | 2468.29   | 3.86         | 100.00     |               |

Table 8.31 Spurlock Creek RM 0.0 to 0.6 Data (Site 51)

| Table 8.31 Spuriock Cree | E. coli       |        | Instantaneous             | Unit Area Load                  |
|--------------------------|---------------|--------|---------------------------|---------------------------------|
|                          | (colonies/100 | Flow   | Load (billion <u>E</u> .  | (million <u>E</u> . <u>coli</u> |
| Collection Date          | mls)          | (cfs)  | <u>coli</u> colonies/day) | colonies/day/acre)              |
| 05/16/08                 | 500           | 24.131 | 295.19                    | 119.59                          |
| 05/30/08                 | 4100          | 15.727 | 1577.57                   | 639.13                          |
| 06/13/08                 | 410           | 11.539 | 115.75                    | 46.89                           |
| 06/27/08                 | 360           | 7.051  | 62.10                     | 25.16                           |
| 07/11/08                 | 600           | N/A    | N/A                       | N/A                             |
| 07/31/08                 | 49000         | 46.941 | 56273.91                  | 22798.74                        |
| 7/31/08 (QA Sample)      | 46000         | 46.941 | N/A                       | N/A                             |
| 08/08/08                 | 400           | 5.676  | 55.55                     | 22.50                           |
| 08/22/08                 | 450           | 1.677  | 18.46                     | 7.48                            |
| 09/12/08                 | 1400          | 20.251 | 693.64                    | 281.02                          |
| 09/20/08                 | 1100          | 3.884  | 104.53                    | 42.35                           |
| 10/17/08                 | 600           | 3.514  | 51.58                     | 20.90                           |
| 10/24/08                 | 10            | 2.294  | 0.56                      | 0.23                            |
| Greatest                 |               |        |                           |                                 |
| Concentration            | 49000         |        |                           |                                 |

Table 8.32 TMDL for Spurlock Creek RM 0.0 to 0.6

| 1 4010 0.5 | z TWIDE for Sp | uriock Creek Rivi u | .0 10 0.0  |             |                | r .                |
|------------|----------------|---------------------|------------|-------------|----------------|--------------------|
|            |                |                     |            |             | E. <u>coli</u> |                    |
|            |                |                     |            |             | (billion       |                    |
| TMDL       |                |                     |            |             | colonies/      |                    |
| Table      |                |                     |            |             | day)           |                    |
|            |                |                     |            |             | • ,            | Existing           |
|            |                |                     |            |             | 6117.7027      | Load               |
|            |                |                     |            |             |                | Total              |
|            |                |                     |            |             | 29.9643        | TMDL               |
|            |                |                     |            |             | 2.9964         | MOS                |
|            |                |                     |            |             |                | TMDL               |
|            |                |                     |            |             | 26.9678        | Target             |
|            |                |                     |            | Design      |                |                    |
| AI         |                | Discharger          |            | Capacity    |                | %                  |
| number     | KPDES #        | Facility Name       | Type       | (cfs)       | 99.60          | reduction          |
| Hamou      | THE DESTI      | Tuesticy Tuestic    | Dwelling   | (CIS)       | 77.00          | reduction          |
|            |                | WILLIAMSON          | Other than |             |                | KPDES              |
| 46144      | KYG401601      | RESIDENCE           | Apartment  | 0.00077361  | 0.0045         | WLA                |
| 70177      | K10401001      | RESIDENCE           | Dwelling   | 0.00077301  | 0.0043         | WLA                |
|            |                | CASE                | Other than |             |                | KPDES              |
| 1161       | KYG400692      | RESIDENCE           | Apartment  | 0.00077361  | 0.0045         | WLA                |
| 1101       | K10400092      | RESIDENCE           | Dwelling   | 0.00077301  | 0.0043         | WLA                |
|            |                | SHREWBERRY          | Other than |             |                | KPDES              |
| 1215       | VVC400677      |                     |            | 0.00077261  | 0.0045         |                    |
| 1315       | KYG400677      | RESIDENCE           | Apartment  | 0.00077361  | 0.0045         | WLA                |
|            |                | CA CTL E            | Dwelling   |             |                | KDDEG              |
| 1160       | 1/1/0/400/70   | CASTLE              | Other than | 0.000773.61 | 0.0045         | KPDES              |
| 1162       | KYG400678      | RESIDENCE           | Apartment  | 0.00077361  | 0.0045         | WLA                |
|            |                |                     |            |             |                | Total              |
|            |                |                     |            |             | 0.0400         | KPDES              |
|            |                |                     |            |             | 0.0180         | WLA                |
|            |                |                     | Addition   |             |                |                    |
|            |                |                     | to MAF     |             |                |                    |
|            |                |                     | (sum of    |             |                |                    |
|            |                |                     | cfs)       | 0.00309446  | 26.9497        | remainder          |
|            |                |                     |            |             |                | Future             |
|            |                |                     |            |             |                | Growth             |
|            |                |                     |            |             | 0.2695         | WLA <sup>(1)</sup> |
|            |                |                     |            |             |                | Total              |
|            |                |                     |            |             | 0.2875         | WLA                |
|            |                |                     |            |             | 26.6802        | LA                 |

Note:
(1) Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

#### 8.9 Sizemore Branch RM 0.0 to 2.0

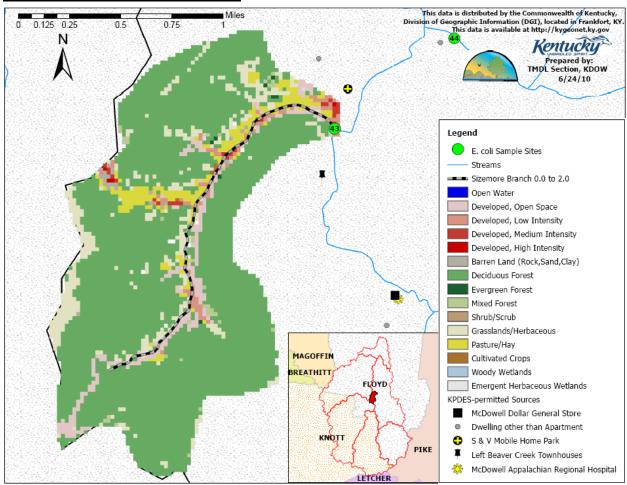


Figure 8.10 Sizemore Branch RM 0.0 to 2.0

Sizemore Branch is a first order stream located in the Lower Left Fork Beaver Creek subwatershed in Floyd County (Figure 8.10). Information about Sizemore Branch, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.33. It has a catchment of 990 acres (1.5 square miles) with an 80% forested and 7% developed land cover (Table 8.34). This subwatershed is entirely un-sewered. There are no stream water withdrawals in this subwatershed. Sampling data from site 43 is presented in Table 8.35 and TMDL allocations in Table 8.36.

Table 8.33 Sizemore Branch RM 0.0 to 2.0 Information

| Stream   | Stream<br>Segment  | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |         |          |
|----------|--------------------|-----------|----------|-----------|-----------------|---------------|---------|---------|----------|
| Sizemore | Sizemore<br>Branch | 502500 01 | Disc. d  | 000.50    | 1.55            | 1-41          |         |         |          |
| Branch   | 0.0 to 2.0         | 503590_01 | Floyd    | 989.59    | 1.55            | 1st order     |         |         |          |
|          |                    |           | Sample   | Sample    |                 |               | + to    | - from  | Adjusted |
| EKU      | MAP                | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site #   | Site #             | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 43       | 43                 | 0.05      | 37.47028 | -82.75408 | 2.1             | 0             | 0.00309 | 0.00000 | 2.1031   |

Table 8.34 Sizemore Branch RM 0.0 to 2.0 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 0.00      | 0.00         | 0.00       |               |
| Developed            | 68.95     | 0.11         | 6.97       | 1.0           |
| Barren Land          | 6.01      | 0.01         | 0.61       |               |
| Forest/Shrubland     | 789.18    | 1.23         | 79.75      |               |
| Grassland/Herbaceous | 81.19     | 0.13         | 8.20       |               |
| Pasture/Hay          | 42.93     | 0.07         | 4.34       |               |
| Cultivated Crops     | 1.33      | 0.00         | 0.13       |               |
| Wetlands             | 0.00      | 0.00         | 0.00       |               |
| Totals               | 989.59    | 1.55         | 100.00     |               |

Table 8.35 Sizemore Branch RM 0.0 to 2.0 Data (site 43)

|                        | E. coli       |        | Instantaneous Load (billion E. | Unit Area Load                  |
|------------------------|---------------|--------|--------------------------------|---------------------------------|
|                        | (colonies/100 | Flow   | <u>coli</u>                    | (million <u>E</u> . <u>coli</u> |
| Collection Date        | mls)          | (cfs)  | colonies/day)                  | colonies/day/acre)              |
| 05/16/08               | 800           | N/A    | N/A                            | N/A                             |
| 05/30/08               | 270           | 0.1229 | 0.81                           | 0.82                            |
| 5/30/08 (QA Sample)    | 220           | N/A    | N/A                            | N/A                             |
| 06/13/08               | 300           | 0.1023 | 0.75                           | 0.76                            |
| 06/27/08               | 760           | 0.0669 | 1.24                           | 1.26                            |
| 07/31/08               | 9000          | N/A    | N/A                            | N/A                             |
| 08/08/08               | 350           | 0.152  | 1.30                           | 1.32                            |
| 08/22/08               | 700           | 0.084  | 1.44                           | 1.45                            |
| 09/12/08               | 1700          | 0.0865 | 3.60                           | 3.64                            |
| 09/20/08               | 39000         | 0.154  | 146.94                         | 148.49                          |
| 9/20/08 (QA Sample)    | 27000         | N/A    | N/A                            | N/A                             |
| 10/17/08               | 1200          | 0.2832 | 8.31                           | 8.40                            |
| 10/24/08               | 72000         | N/A    | N/A                            | N/A                             |
| Greatest Concentration | 72000         |        |                                |                                 |

Table 8.36 TMDL for Sizemore Branch RM 0.0 to 2.0

| 1 aute 6.50 | O IMDL IOI SI                           | zemore Branch | NIVI 0.0 to 2.0 |          |           |                    |
|-------------|---|---------------|-----------------|----------|-----------|--------------------|
|             |   |               |                 |          | E. coli   |                    |
|             |   |               |                 |          | (billion  |                    |
| TMDL        |   |               |                 |          | colonies/ |                    |
| Table       |   |               |                 |          | day)      |                    |
| Tuote       |   |               |                 |          | uay)      | Existing           |
|             |   |               |                 |          | 3704.6737 | Load               |
|             |   |               |                 |          | 3704.0737 |                    |
|             |   |               |                 |          | 12 2400   | Total              |
|             |   |               |                 |          | 12.3489   | TMDL               |
|             |   |               |                 |          | 1.2349    | MOS                |
|             |   |               |                 |          |           | TMDL               |
|             |   |               |                 |          | 11.1140   | Target             |
|             |   | Discharger    |                 | Design   |           |                    |
| AI          |   | Facility      |                 | Capacity |           | %                  |
| number      | KPDES#                                  | Name          | Type            | (cfs)    | 99.70     | reduction          |
|             |   |               | Dwelling        |          |           |                    |
|             |   | YOUMANS       | Other than      |          |           | KPDES              |
| 1369        | KYG400724                               | RESIDENCE     | Apartment       | 0.000774 | 0.0045    | WLA                |
| 1307        | 111 0 100 / 21                          | RESIDENCE     | Dwelling        | 0.000771 | 0.0018    | VV E/I             |
|             |   | HICKS         | Other than      |          |           | KPDES              |
| 1218        | KYG400567                               | RESIDENCE     |                 | 0.000774 | 0.0045    | WLA                |
| 1210        | K1U400307                               | KESIDENCE     | Apartment       | 0.000774 | 0.0043    | WLA                |
|             |   | COLLING       | Dwelling        |          |           | LABBLE             |
| 11.60       | *************************************** | COLLINS       | Other than      | 0.000    | 0.004=    | KPDES              |
| 1168        | KYG400854                               | RESIDENCE     | Apartment       | 0.000774 | 0.0045    | WLA                |
|             |   |               | Dwelling        |          |           |                    |
|             |   | COLLINS       | Other than      |          |           | KPDES              |
| 1168        | KYG401516                               | RESIDENCE     | Apartment       | 0.000774 | 0.0045    | WLA                |
|             |   |               |                 |          |           | Total              |
|             |   |               |                 |          |           | KPDES              |
|             |   |               |                 |          | 0.0180    | WLA                |
|             |   |               | Addition to     |          |           |                    |
|             |   |               | MAF (sum        |          |           |                    |
|             |   |               | of cfs)         | 0.003094 | 11.0959   | remainder          |
|             |   |               | 01 015)         | 0.005071 | 11.0707   | Future             |
|             |   |               |                 |          |           | Growth             |
|             |   |               |                 |          | 0.1110    | WLA <sup>(1)</sup> |
|             |   |               |                 |          | 0.1110    |                    |
|             |   |               |                 |          | 0.1200    | Total              |
|             |   |               |                 |          | 0.1290    | WLA                |
|             |   |               |                 |          | 10.9849   | LA                 |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

# 8.10 Spewing Camp Branch RM 0.0 to 3.1

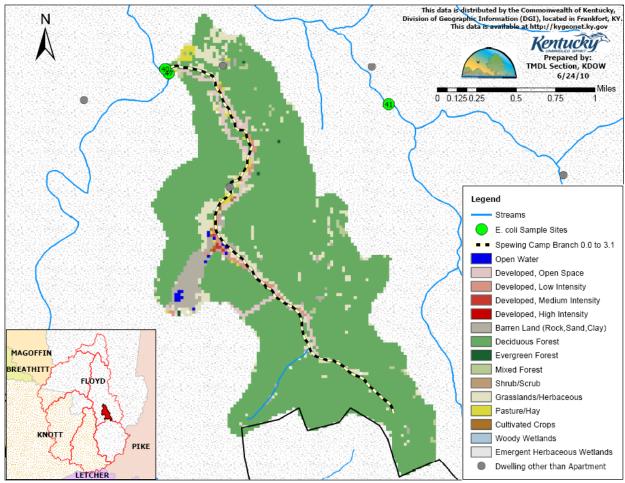


Figure 8.11 Spewing Camp Branch RM 0.0 to 3.1

Spewing Camp Branch is a second order stream located in the Lower Left Fork Beaver Creek subwatershed in Floyd County (Figure 8.11). Information about Spewing Camp Branch, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.37. It has a catchment of 1,572 acres (2.5 square miles) with an 85% forested and 3.7% developed land cover (Table 8.38). This subwatershed is entirely un-sewered. There are no stream water withdrawals in this subwatershed. Sampling data from site 40 is presented in Table 8.39 and TMDL allocations in Table 8.40.

Table 8.37 Spewing Camp Branch RM 0.0 to 3.1 Information

|            |         | <u> </u>  |          |           |        |               |         |         |          |
|------------|---------|-----------|----------|-----------|--------|---------------|---------|---------|----------|
| <b>a</b> . | Stream  |           |          |           | Square |               |         |         |          |
| Stream     | Segment | WBID#     | County   | Acres     | Miles  | Stream Order  |         |         |          |
|            | Spewing |           |          |           |        |               |         |         |          |
|            | Camp    |           |          |           |        |               |         |         |          |
|            | Branch  |           |          |           |        |               |         |         |          |
| Spewing    | 0.0 to  |           |          |           |        |               |         |         |          |
| Camp       | 3.1     | 504061_01 | Floyd    | 1572.02   | 2.46   | 2nd order     |         |         |          |
|            |         |           | Sample   | Sample    |        |               | + to    | - from  | Adjusted |
| EKU        | MAP     | Sample    | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF     | MAF      |
| Site #     | Site #  | Point RM  | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs)   | (cfs)    |
| 40         | 40      | 0.05      | 37.43039 | -82.73443 | 3.4    | 0             | 0.00155 | 0.00000 | 3.4015   |

Table 8.38 Spewing Camp Branch RM 0.0 to 3.1 Subwatershed Land Cover

| 1 0                  | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 4.00      | 0.01         | 0.25       |               |
| Developed            | 57.39     | 0.09         | 3.65       | 0.5           |
| Barren Land          | 45.82     | 0.07         | 2.91       |               |
| Forest/Shrubland     | 1340.68   | 2.09         | 85.28      |               |
| Grassland/Herbaceous | 106.77    | 0.17         | 6.79       |               |
| Pasture/Hay          | 15.13     | 0.02         | 0.96       |               |
| Cultivated Crops     | 2.00      | 0.00         | 0.13       |               |
| Wetlands             | 0.22      | 0.00         | 0.01       |               |
| Totals               | 1572.02   | 2.46         | 100.00     |               |

Table 8.39 Spewing Camp Branch RM 0.0 to 3.1 Data (Site 40)

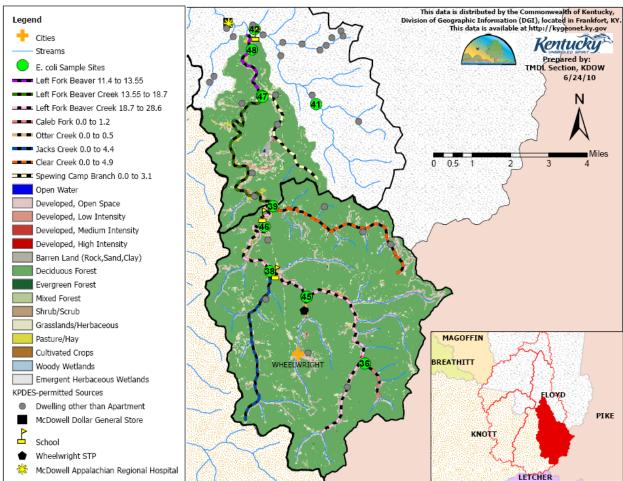
| Tuoic 6.57 Spewing cump | E. coli       |            | Instantaneous             | Unit Area Load                  |
|-------------------------|---------------|------------|---------------------------|---------------------------------|
|                         | (colonies/100 |            | Load (billion <u>E</u> .  | (million <u>E</u> . <u>coli</u> |
| Collection Date         | mls)          | Flow (cfs) | <u>coli</u> colonies/day) | colonies/day/acre)              |
| 05/16/08                | 1300          | N/A        | N/A                       | N/A                             |
| 05/30/08                | <10           | 0.122      | 0.03                      | 0.02                            |
| 06/13/08                | 200           | 0.0464     | 0.23                      | 0.14                            |
| 6/13/08 (QA Sample)     | 300           | N/A        | N/A                       | N/A                             |
| 06/27/08                | 100           | 0.0476     | 0.12                      | 0.07                            |
| 07/11/08                | 310           | 0.098      | 0.74                      | 0.47                            |
| 07/31/08                | 52000         | 25.9819    | 33054.68                  | 21026.88                        |
| 08/08/08                | 40            | 5.278      | 5.17                      | 3.29                            |
| 08/22/08                | 90            | 0.065      | 0.14                      | 0.09                            |
| 8/22/08 (QA Sample)     | 160           | N/A        | N/A                       | N/A                             |
| 09/12/08                | 190           | 0.522      | 2.43                      | 1.54                            |
| 09/20/08                | <10           | 0.065      | 0.02                      | 0.01                            |
| 10/17/08                | 190           | 0.0408     | 0.19                      | 0.12                            |
| 10/17/08 (QA Sample)    | 190           | N/A        | N/A                       | N/A                             |
| 10/24/08                | 10            | 0.038      | 0.01                      | 0.01                            |
| Greatest Concentration  | 52000         |            |                           |                                 |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

Table 8.40 TMDL for Spewing Camp Branch RM 0.0 to 3.1

| 1 aut 6.40 | o IMDL for Spe | ewing Camp Bra | Hell Kivi U.U to | 3.1        |                        |                    |
|------------|----------------|----------------|------------------|------------|------------------------|--------------------|
|            |                |                |                  |            | <u>E</u> . <u>coli</u> |                    |
|            |                |                |                  |            | (billion               |                    |
| TMDL       |                |                |                  |            | colonies/              |                    |
| Table      |                |                |                  |            | day)                   |                    |
|            |                |                |                  |            |                        | Existing           |
|            |                |                |                  |            | 4327.5145              | Load               |
|            |                |                |                  |            |                        | Total              |
|            |                |                |                  |            | 19.9731                | TMDL               |
|            |                |                |                  |            | 1.9973                 | MOS                |
|            |                |                |                  |            |                        | TMDL               |
|            |                |                |                  |            | 17.9758                | Target             |
|            |                |                |                  |            | 17.9736                | Target             |
|            |                | Discharger     |                  | Design     |                        |                    |
| AI         |                | Facility       |                  | Capacity   |                        | %                  |
| number     | KPDES #        | Name           | Type             | (cfs)      | 99.58                  | reduction          |
|            |                |                | Dwelling         |            |                        |                    |
|            |                | BARTLEY        | Other than       |            |                        | KPDES              |
| 4405       | KYG401197      | RESIDENCE      | Apartment        | 0.00077361 | 0.0045                 | WLA                |
| 4403       | K10401197      | RESIDENCE      | Apartificit      | 0.00077301 | 0.0043                 | WLA                |
|            |                |                | Dwelling         |            |                        |                    |
|            |                | YORK           | Other than       |            |                        | KPDES              |
| 49354      | KYG401654      | RESIDENCE      | Apartment        | 0.00077361 | 0.0045                 | WLA                |
|            |                |                |                  |            |                        | Total              |
|            |                |                |                  |            |                        | KPDES              |
|            |                |                |                  |            | 0.0090                 | WLA                |
|            |                |                |                  |            | 0.0070                 | WLA                |
|            |                |                | Addition to      |            |                        |                    |
|            |                |                | MAF (sum         |            |                        |                    |
|            |                |                | of cfs)          | 0.00154723 | 17.9667                | remainder          |
|            |                |                |                  |            |                        | Future             |
|            |                |                |                  |            |                        | Growth             |
|            |                |                |                  |            | 0.0898                 | WLA <sup>(1)</sup> |
|            |                |                |                  |            | 0.0070                 | Total              |
|            |                |                |                  |            | 0.0988                 | WLA                |
|            |                |                |                  |            | 17.8769                | LA                 |
|            |                |                |                  |            | 17.0709                | LA                 |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.



# 8.11 Left Fork Beaver Creek RM 11.4 to 13.55

Figure 8.12 Left Fork Beaver Creek RM 11.4 to 13.55

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 37 is under site 45 and site 40 is under site 47.

Left Fork Beaver Creek at RM 13.55 is a fourth order stream located in Floyd County (Figure 8.12). Information about Left Fork Beaver Creek at RM 13.55, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.41. Its watershed encompasses all of the Upper Left Fork Beaver Creek subwatershed and upper portions of the Lower Left Fork Beaver Creek subwatershed. It has a catchment of 25,003 acres (39.1 square miles) with an 85% forested and 6.8% developed land cover (Table 8.42). Portions of this subwatershed around the city of Wheelwright are sewered (see Figure 5.16). There is one stream water withdrawal in this subwatershed at RM 15.36 of the Left Fork Beaver Creek (see Table 8.43). Sampling data from site 48 is presented in Table 8.44 and TMDL allocations in Table 8.45.

Table 8.41 Left Fork Beaver Creek RM 11.4 to 13.55 Information

| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |         |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|---------|----------|
|        | Left              |           |          |           |                 |               |         |         |          |
|        | Fork              |           |          |           |                 |               |         |         |          |
| Left   | Beaver            |           |          |           |                 |               |         |         |          |
| Fork   | Creek             |           |          |           |                 |               |         |         |          |
| Beaver | 11.4 to           |           |          |           |                 |               |         |         |          |
| Creek  | 13.55             | 496194_02 | Floyd    | 25003.22  | 39.07           | 4th order     |         |         |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from  | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 48     | 48                | 11.8      | 37.44780 | -82.73840 | 53.4            | 11.4          | 0.39114 | 0.09283 | 53.6983  |

Table 8.42 Left Fork Beaver Creek RM 11.4 to 13.55 Subwatershed Land Cover

| Land Cover            | Watershed<br>Acres | Watershed<br>Square Miles | % of Total<br>Area | Future Growth WLA % |
|-----------------------|--------------------|---------------------------|--------------------|---------------------|
| Open Water            | 4.01               | 0.01                      | 0.02               |                     |
| Developed             | 1698.37            | 2.65                      | 6.79               | 1.0                 |
| Barren Land           | 254.32             | 0.40                      | 1.02               |                     |
| Forest/Shrubland      | 21252.92           | 33.21                     | 85.00              |                     |
| Grassland/ Herbaceous | 1446.28            | 2.26                      | 5.78               |                     |
| Pasture/ Hay          | 316.85             | 0.50                      | 1.27               |                     |
| Cultivated Crops      | 28.70              | 0.04                      | 0.11               |                     |
| Wetlands              | 1.78               | 0.00                      | 0.01               |                     |
| Totals                | 25003.22           | 39.07                     | 100.00             |                     |

Table 8.43 Left Fork Beaver Creek RM 11.4 to 13.55 Water Withdrawals

|   | AI     |                    | Withdrawal    | Withdrawal | Facility | Facility  |
|---|--------|--------------------|---------------|------------|----------|-----------|
|   | number | Source Description | Facility Name | (cfs)      | Latitude | Longitude |
| ſ |        | RM 15.36 of Left   | Elk Horn Coal |            |          |           |
|   | 1299   | Fork Beaver Creek  | Co LLC        | 0.09283372 | 37.40129 | -82.74175 |
| ſ |        |                    | subtraction   |            |          |           |
|   |        |                    | from MAF      |            |          |           |
|   |        |                    | (sum of cfs)  | 0.09283372 |          |           |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

September, 2010

Table 8.44 Left Fork Beaver Creek RM 11.4 to 13.55 Data (Site 48)

|                        | E. coli<br>(colonies/100 | Flow    | Instantaneous Load (billion <u>E</u> . coli | Unit Area Load (million E. coli |
|------------------------|--------------------------|---------|---|---------------------------------|
| Collection Date        | mls)                     | (cfs)   | colonies/day)                               | colonies/day/acre)              |
| 05/16/08               | 130                      | N/A     | N/A   | N/A                             |
| 05/30/08               | 100                      | 9.071   | 22.19                                       | 0.89                            |
| 06/13/08               | 80                       | 7.686   | 15.04                                       | 0.60                            |
| 06/27/08               | 250                      | 4.4441  | 27.18                                       | 1.09                            |
| 07/31/08               | 69000                    | N/A     | N/A   | N/A                             |
| 08/08/08               | 250                      | 6.695   | 40.95                                       | 1.64                            |
| 08/22/08               | 100                      | 1.373   | 3.36  | 0.13                            |
| 09/12/08               | 2100                     | 114.166 | 5865.63                                     | 234.60                          |
| 09/20/08               | 110                      | 2.553   | 6.87  | 0.27                            |
| 10/17/08               | 50                       | 2.8575  | 3.50  | 0.14                            |
| 10/24/08               | 190                      | 1.4364  | 6.68  | 0.27                            |
| Greatest Concentration | 69000                    |         |   |                                 |

Table 8.45 TMDL for Left Fork Beaver Creek RM 11.4 to 13.55

|        | l IIIIDE IOI | Lett Fork Beaver | e ereck rayr rr. r | 10 15.55 | D 1: (1:11:      |                      |
|--------|--------------|------------------|--------------------|----------|------------------|----------------------|
| TMDL   |              |                  |                    |          | E. coli (billion |                      |
| Table  |              |                  |                    |          | colonies/ day)   |                      |
|        |              |                  |                    |          | 90650.1145       | Existing Load        |
|        |              |                  |                    |          | 315.3047         | Total TMDL           |
|        |              |                  |                    |          | 31.5305          | MOS                  |
|        |              |                  |                    |          | 283.7743         | TMDL Target          |
|        |              |                  |                    | Design   |                  |                      |
| AI     |              | Discharger       |                    | Capacity |                  |                      |
| number | KPDES#       | Facility Name    | Type               | (cfs)    | 99.69            | % reduction          |
|        |              | BINGHAM          | Dwelling Other     |          |                  |                      |
| 1237   | KYG400753    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
|        |              | MEADE            | Dwelling Other     |          |                  |                      |
| 1266   | KYG400970    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
| 1200   | K10400970    | COOK             | Dwelling Other     | 0.000774 | 0.0043           | KIDES WLA            |
| 1173   | KYG400790    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
| 11/3   | K10400790    | MULLINS          | Dwelling Other     | 0.000774 | 0.0043           | KI DES WLA           |
| 1274   | KYG400714    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
| 12/4   | KTO400/14    | DYE              | Dwelling Other     | 0.000774 | 0.0043           | KI DES WEA           |
| 4333   | KYG401140    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
| 4333   | K10401140    | JONES            | Dwelling Other     | 0.000774 | 0.0043           | KIDES WLA            |
| 4349   | KYG401133    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
| 4349   | K10401133    | OSBORNE          | than Apartment     | 0.000774 | 0.0043           | KIDES WLA            |
| 35251  | KY0089435    | ELEM SCHOOL      | School             | 0.010521 | 0.0618           | KPDES WLA            |
| 33231  | K10007433    | WHEEL-           | Sewerage           | 0.010321 | 0.0016           | KI DES WEA           |
| 40534  | KY0028789    | WRIGHT STP       | System             | 0.348127 | 2.0441           | KPDES WLA            |
| 40334  | 10020707     | CAUDILL          | Dwelling Other     | 0.540127 | 2.0771           | KI DES WEIT          |
| 44695  | KYG401580    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
|        | 1210101000   | COCHRAN          | Dwelling Other     | 0.000771 | 0.0012           | IN DES WEIT          |
| 48897  | KYG401646    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
| 10071  |              | YORK             | Dwelling Other     |          | 010010           |                      |
| 49354  | KYG401654    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
|        |              | TACKETT          | Dwelling Other     |          |                  |                      |
| 74181  | KYG401470    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
|        |              | MULLINS II       | Dwelling Other     |          |                  |                      |
| 74062  | KYG401442    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
|        |              | BARTLEY          | Dwelling Other     |          |                  |                      |
| 4405   | KYG401197    | RESIDENCE        | than Apartment     | 0.000774 | 0.0045           | KPDES WLA            |
|        |              | SOUTH FLOYD      |                    |          |                  |                      |
| 35260  | KY0093912    | HIGH SCHOOL      | School             | 0.023208 | 0.1363           | KPDES WLA            |
|        |              |                  |                    |          |                  | Total KPDES          |
|        |              |                  |                    |          | 2.2962           | WLA                  |
|        |              |                  | Addition to MAF    |          |                  |                      |
|        |              |                  | (sum of cfs)       | 0.391139 | 281.4776         | remainder            |
|        |              |                  |                    |          |                  | Future Growth        |
|        |              |                  |                    |          | 2.8148           | $\mathbf{WLA}^{(1)}$ |
|        |              |                  |                    |          | 5.1110           | Total WLA            |
|        |              |                  |                    |          | 278.6628         | LA                   |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

### 8.12 Left Fork Beaver Creek RM 0.0 to 11.4

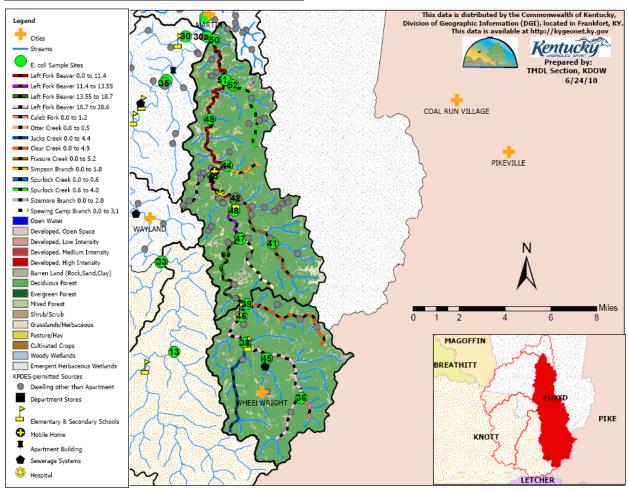


Figure 8.13 Left Fork Beaver Creek RM 0.0 to 11.4

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 27 is under site 35, site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Left Fork Beaver Creek at RM 0.0 is a fourth order stream located in Floyd County (Figure 8.13). Its subwatershed encompasses all of the Upper and Lower Left Fork Beaver Creek subwatersheds. Information about Left Fork Beaver 0.0 to 11.4, including sample site locations, waterbody identification number (WBID), and MAF is shown in Table 8.46. It has a catchment of 46,862 acres (73 square miles) with an 82% forested and 6.8% developed land cover (Table 8.47). Portions of this subwatershed are sewered around the city of Wheelwright (see Figure 5.16). There are two stream water withdrawals in this subwatershed at RMs 15.36 and 2.4 of Left Fork Beaver Creek (see Table 8.48). This segment had two sample sites and data from sites 49 and 50 is presented in Table 8.49. Site 49 had the greatest concentration (53,000) so this concentration was used to set the existing loads and percent reduction for the impaired segment. However, to extrapolate to the end of the impaired segment, the Adjusted MAF from site 50 (97.7535 cfs) was used as the flow to set the TMDL for this impaired segment. The TMDL calculations for site 49 and 50 are shown in Appendix E while the TMDL for Left Fork Beaver Creek RM 0.0 to 11.4 is shown in Table 8.50.

Table 8.46 Left Fork Beaver Creek RM 0.0 to 11.4 Information

|        |                   |           |          |           |                 | ,             |         |         |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|---------|----------|
| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |         |          |
|        | Left              |           |          |           |                 |               |         |         |          |
|        | Fork              |           |          |           |                 |               |         |         |          |
| Left   | Beaver            |           |          |           |                 |               |         |         |          |
| Fork   | Creek             |           |          |           |                 |               |         |         |          |
| Beaver | 0.0 to            |           |          |           |                 |               |         |         |          |
| Creek  | 11.4              | 496194_01 | Floyd    | 46861.59  | 73.221          | 4th order     |         |         |          |
|        |                   |           |          |           |                 |               |         |         |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from  | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 49     | 49                | 5.6       | 37.50640 | -82.75550 | 84.5            | 5.6           | 0.50857 | 0.09283 | 84.9157  |
| 50     | 50                | 0.3       | 37.55640 | -82.74970 | 98              | 0             | 0.51476 | 0.76124 | 97.7535  |

Table 8.47 Left Fork Beaver Creek RM 0.0 to 11.4 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 12.46     | 0.02         | 0.03       |               |
| Developed            | 3207.43   | 5.01         | 6.84       | 1.0           |
| Barren Land          | 483.82    | 0.76         | 1.03       |               |
| Forest/Shrubland     | 38659.82  | 60.41        | 82.50      |               |
|                      |           |              |            |               |
| Grassland/Herbaceous | 3224.34   | 5.04         | 6.88       |               |
| Pasture/Hay          | 1178.07   | 1.84         | 2.51       |               |
| Cultivated Crops     | 90.31     | 0.14         | 0.19       |               |
| Wetlands             | 5.34      | 0.01         | 0.01       |               |
| Totals               | 46861.59  | 73.22        | 100.00     | _             |

Table 8.48 Left Fork Beaver Creek RM 0.0 to 11.4 Water Withdrawals

|           | Source       | Withdrawal       | Withdrawal | Facility | Facility  |
|-----------|--------------|------------------|------------|----------|-----------|
| AI number | Description  | Facility Name    | (cfs)      | Latitude | Longitude |
|           | RM 15.36 of  |                  |            |          |           |
|           | Left Fork    | Elk Horn Coal Co |            |          |           |
| 1299      | Beaver Creek | LLC              | 0.09283372 | 37.40129 | -82.74175 |
|           | RM 2.4 of    |                  |            |          |           |
|           | Left Fork    | Black Diamond    |            |          |           |
| 78571     | Beaver Creek | Mining           | 0.6684028  | 37.53192 | -82.74364 |
|           |              | subtraction from |            |          |           |
|           |              | MAF (sum of cfs) | 0.76123652 |          |           |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

September, 2010

Table 8.49 Left Fork Beaver Creek RM 0.0 to 11.4 Data (Sites 49 and 50)

| Site 49   | CICCH THVI 0.0                                      | 10 11.12 000   | a (Sites 49 and 50)   |  |
|---|---|--|---|--|
| SILC 49   | E. coli   |  | Instantaneous Load  | Unit Area Load   |
|   | (colonies/100                                       | Flow   | (billion <u>E</u> . coli  | (million <u>E</u> . coli   |
| Collection Date   | mls)  | (cfs)  | colonies/day)   | colonies/day/acre)   |
| 05/16/08  | 170   | N/A  | N/A   | N/A  |
| 05/30/08  | 30  | 11.975   | 8.79  | 0.22   |
| 5/30/08 (QA Sample)   | 20  | N/A  | N/A   | N/A  |
| 06/13/08  | 60  | 7.4685   | 10.96   | 0.27   |
| 06/27/08  | 110   | 7.915  | 21.30   | 0.53   |
| 07/31/08  | 53000   | 37.108   | 48117.39  | 1202.13  |
| 08/08/08  | 70  | 8.333  | 14.27   | 0.36   |
| 08/22/08  | <10   | 1.803  | 0.44  | 0.01   |
| 09/12/08  | 380   | N/A  | N/A   | N/A  |
| 9/12/08 (QA Sample)   | 240   | N/A  | N/A   | N/A  |
| 09/20/08  | 130   | 1.8648   | 5.93  | 0.15   |
| 10/17/08  | 100   | 3.999  | 9.78  | 0.24   |
| 10/24/08  | 170   | 3.356  | 13.96   | 0.35   |
| Greatest Concentration  | 53000   |  |   |  |
| Greatest Concentration  | 33000   |  |   |  |
| Site 50   |   |  |   |  |
|   | E. coli   |  | Instantaneous Load  | Unit Area Load   |
|   | (colonies/100                                       | T-1  | /1 '11' E 1'  |  |
|   | × .   | Flow   | (billion <u>E</u> . <u>coli</u>   | (million <u>E</u> . <u>coli</u>  |
| Collection Date   | mls)  | (cfs)  | colonies/day)   | colonies/day/acre)   |
| Collection Date 05/16/08  | mls) 390  |  |   |  |
|   | mls)<br>390<br>600                                  | (cfs)  | colonies/day)   | colonies/day/acre)   |
| 05/16/08  | mls) 390  | (cfs)<br>N/A   | colonies/day)<br>N/A  | colonies/day/acre) N/A   |
| 05/16/08<br>05/30/08  | mls)<br>390<br>600                                  | (cfs)<br>N/A<br>N/A  | colonies/day) N/A N/A   | colonies/day/acre) N/A N/A   |
| 05/16/08<br>05/30/08<br>06/13/08  | mls) 390 600 220                                    | (cfs) N/A N/A N/A  | N/A N/A N/A   | colonies/day/acre) N/A N/A N/A   |
| 05/16/08<br>05/30/08<br>06/13/08<br>6/13/08 (QA Sample)   | mls) 390 600 220 190                                | (cfs) N/A N/A N/A N/A  | N/A N/A N/A N/A N/A   | N/A N/A N/A N/A N/A  |
| 05/16/08<br>05/30/08<br>06/13/08<br>6/13/08 (QA Sample)<br>06/27/08   | mls) 390 600 220 190 70                             | (cfs) N/A N/A N/A N/A N/A  | colonies/day) N/A N/A N/A N/A N/A N/A                                   | N/A N/A N/A N/A N/A N/A N/A N/A  |
| 05/16/08<br>05/30/08<br>06/13/08<br>6/13/08 (QA Sample)<br>06/27/08<br>07/11/08   | mls) 390 600 220 190 70 390                         | (cfs) N/A N/A N/A N/A N/A 12.956                                   | N/A N/A N/A N/A N/A N/A 123.62  | N/A N/A N/A N/A N/A N/A 2.64   |
| 05/16/08<br>05/30/08<br>06/13/08<br>6/13/08 (QA Sample)<br>06/27/08<br>07/11/08<br>07/31/08   | mls) 390 600 220 190 70 390 27000                   | (cfs) N/A N/A N/A N/A N/A 12.956 N/A                               | N/A                                 | N/A  |
| 05/16/08<br>05/30/08<br>06/13/08<br>6/13/08 (QA Sample)<br>06/27/08<br>07/11/08<br>07/31/08<br>08/08/08                                     | mls) 390 600 220 190 70 390 27000 220               | (cfs) N/A N/A N/A N/A N/A 12.956 N/A 5.708                         | Colonies/day)   N/A   | N/A  |
| 05/16/08<br>05/30/08<br>06/13/08<br>6/13/08 (QA Sample)<br>06/27/08<br>07/11/08<br>07/31/08<br>08/08/08<br>08/22/08                         | mls) 390 600 220 190 70 390 27000 220 240           | (cfs) N/A N/A N/A N/A N/A N/A 12.956 N/A 5.708 0.0144              | N/A N/A N/A N/A N/A N/A N/A N/A N/A 123.62 N/A 30.72 0.08               | N/A           N/A           N/A           N/A           N/A           N/A           2.64           N/A           0.66           0.00 |
| 05/16/08<br>05/30/08<br>06/13/08<br>6/13/08 (QA Sample)<br>06/27/08<br>07/11/08<br>07/31/08<br>08/08/08<br>08/22/08<br>09/12/08             | mls) 390 600 220 190 70 390 27000 220 240 16000     | (cfs) N/A N/A N/A N/A N/A N/A 12.956 N/A 5.708 0.0144 22.148       | N/A N/A N/A N/A N/A N/A N/A N/A N/A 123.62 N/A 30.72 0.08 8669.88       | N/A N/A N/A N/A N/A N/A N/A N/A N/A 0.66 0.00 185.01   |
| 05/16/08<br>05/30/08<br>06/13/08<br>6/13/08 (QA Sample)<br>06/27/08<br>07/11/08<br>07/31/08<br>08/08/08<br>08/22/08<br>09/12/08<br>09/20/08 | mls) 390 600 220 190 70 390 27000 220 240 16000 170 | (cfs) N/A N/A N/A N/A N/A N/A 12.956 N/A 5.708 0.0144 22.148 3.596 | N/A N/A N/A N/A N/A N/A N/A N/A N/A 123.62 N/A 30.72 0.08 8669.88 14.96 | N/A N/A N/A N/A N/A N/A N/A N/A N/A 0.66 0.00 185.01 0.32  |

Table 8.50 TMDL for Left Fork Beaver Creek RM 0.0 to 11.4

|        | 50 IMDL 101 | r Left Fork Beaver | r Creek RM 0. | 0 to 11.4 |                         |             |
|--------|-------------|--------------------|---------------|-----------|-------------------------|-------------|
| TMDL   |             |                    |               |           | E. <u>coli</u> (billion |             |
| Table  |             |                    |               |           | colonies/day)           |             |
|        |             |                    |               |           | 10/                     | Existing    |
|        |             |                    |               |           | 126755.5507             | Load        |
|        |             |                    |               |           |                         | Total       |
|        |             |                    |               |           | 573.9874                | TMDL        |
|        |             |                    |               |           | 57.3987                 | MOS         |
|        |             |                    |               |           |                         | TMDL        |
|        |             |                    |               |           | 516.5887                | Target      |
|        |             |                    |               | Design    |                         |             |
| ΑI     |             | Discharger         |               | Capacity  |                         |             |
| number | KPDES#      | Facility Name      | Туре          | (cfs)     | 99.59                   | % reduction |
|        |             | WHEELWRIGHT        | Sewerage      |           |                         | KPDES       |
| 40534  | KY0028789   | STP                | System        | 0.3481265 | 2.0441                  | WLA         |
|        |             | MCDOWELL           |               |           |                         | KPDES       |
| 35252  | KY0079421   | ELEM SCHOOL        | School        | 0.0232084 | 0.1363                  | WLA         |
|        |             | MCDOWELL           |               |           |                         |             |
|        |             | APPALACHIAN        |               |           |                         | KPDES       |
| 1134   | KY0085791   | REG HOSP           | Hospital      | 0.0309446 | 0.1817                  | WLA         |
|        |             | OSBORNE            |               |           |                         | KPDES       |
| 35251  | KY0089435   | ELEM SCHOOL        | School        | 0.0105212 | 0.0618                  | WLA         |
|        |             | SOUTH FLOYD        |               |           |                         | KPDES       |
| 35260  | KY0093912   | HIGH SCHOOL        | School        | 0.0232084 | 0.1363                  | WLA         |
|        |             | LEFT BEAVER        |               |           |                         |             |
|        |             | CREEK              | Apartment     |           |                         | KPDES       |
| 1255   | KY0096342   | TOWNHOUSES         | Building      | 0.0278501 | 0.1635                  | WLA         |
|        |             | MCDOWELL           |               |           |                         |             |
|        |             | DOLLAR             |               |           |                         |             |
|        |             | GENERAL            | Department    |           |                         | KPDES       |
| 1263   | KY0103136   | STORE              | Store         | 0.0007736 | 0.0045                  | WLA         |
|        |             |                    | Mobile Home   |           |                         | KPDES       |
| 1305   | KY0103233   | S & V MHP          | Site          | 0.0153176 | 0.0899                  | WLA         |
|        |             |                    | Dwelling      |           |                         |             |
|        |             | MITCHELL           | Other than    |           |                         | KPDES       |
| 1269   | KYG400478   | RESIDENCE          | Apartment     | 0.0007736 | 0.0045                  | WLA         |
|        |             |                    | Dwelling      |           |                         |             |
|        |             | BLACKBURN          | Other than    |           |                         | KPDES       |
| 1143   | KYG400479   | RESIDENCE          | Apartment     | 0.0007736 | 0.0045                  | WLA         |
|        |             |                    | Dwelling      |           |                         |             |
|        |             | HICKS              | Other than    |           |                         | KPDES       |
| 1218   | KYG400567   | RESIDENCE          | Apartment     | 0.0007736 | 0.0045                  | WLA         |
|        |             |                    | Dwelling      |           |                         |             |
|        |             | WRIGHT             | Other than    |           |                         | KPDES       |
| 1367   | KYG400579   | RESIDENCE          | Apartment     | 0.0007736 | 0.0045                  | WLA         |
|        |             |                    | Dwelling      |           |                         |             |
|        |             | STUMBO             | Other than    |           |                         | KPDES       |
| 1327   | KYG400601   | RESIDENCE          | Apartment     | 0.0007736 | 0.0045                  | WLA         |
|        |             |                    | Dwelling      |           |                         |             |
|        |             | DYE                | Other than    |           |                         | KPDES       |
| 1182   | KYG400614   | RESIDENCE          | Apartment     | 0.0007736 | 0.0045                  | WLA         |
|        |             |                    | Dwelling      |           |                         |             |
|        |             | CURRENT            | Other than    |           |                         | KPDES       |
| 4250   | KYG400659   | RESIDENCE          | Apartment     | 0.0007736 | 0.0045                  | WLA         |

|        |              |   |                    | Design     |   |        |
|--------|--------------|---|--------------------|------------|---|--------|
| AI     |              | Discharger                              |                    | Capacity   | E. coli (billion                        |        |
| number | KPDES#       | Facility Name                           | Type               | (cfs)      | colonies/day)                           |        |
|        |              |   | Dwelling           |            |   |        |
|        |              | SHREWBERRY                              | Other than         |            |   | KPDES  |
| 1315   | KYG400677    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              |   | Dwelling           |            |   |        |
|        |              | CASTLE                                  | Other than         |            |   | KPDES  |
| 1162   | KYG400678    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              |   | Dwelling           |            |   |        |
|        |              | CASE                                    | Other than         |            |   | KPDES  |
| 1161   | KYG400692    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              |   | Dwelling           |            |   |        |
|        |              | MULLINS                                 | Other than         |            |   | KPDES  |
| 1274   | KYG400714    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              | **********                              | Dwelling           |            |   |        |
| 10.00  |              | YOUMANS                                 | Other than         |            | 0.004=                                  | KPDES  |
| 1369   | KYG400724    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              | DD1GH AA                                | Dwelling           |            |   |        |
| 1007   | 1/3/0/400753 | BINGHAM                                 | Other than         | 0.0007736  | 0.0045                                  | KPDES  |
| 1237   | KYG400753    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              | COOK                                    | Dwelling           |            |   | LADDEC |
| 1172   | VVC400700    | COOK<br>RESIDENCE                       | Other than         | 0.0007726  | 0.0045                                  | KPDES  |
| 1173   | KYG400790    | RESIDENCE                               | Apartment Dwelling | 0.0007736  | 0.0045                                  | WLA    |
|        |              | COLLINS                                 | Other than         |            |   | KPDES  |
| 1168   | KYG400854    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
| 1100   | K1U400634    | RESIDENCE                               | Dwelling           | 0.0007730  | 0.0043                                  | WLA    |
|        |              | HALL                                    | Other than         |            |   | KPDES  |
| 1202   | KYG400969    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
| 1202   | 111 0 100707 | RESIDENCE                               | Dwelling           | 0.0007750  | 0.0043                                  | VV EAR |
|        |              | MEADE                                   | Other than         |            |   | KPDES  |
| 1266   | KYG400970    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              |   | Dwelling           |            | *************************************** | .,,    |
|        |              | HOWELL                                  | Other than         |            |   | KPDES  |
| 4356   | KYG401040    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              |   | Dwelling           |            |   |        |
|        |              | JONES                                   | Other than         |            |   | KPDES  |
| 4349   | KYG401133    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              |   | Dwelling           |            |   |        |
|        |              | DYE                                     | Other than         |            |   | KPDES  |
| 4333   | KYG401140    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              |   | Dwelling           |            |   |        |
|        |              | TACKETT                                 | Other than         |            |   | KPDES  |
| 4332   | KYG401142    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              | D 4 D ================================= | Dwelling           |            |   |        |
| 4.40.5 | WWG 401105   | BARTLEY                                 | Other than         | 0.000773.6 | 0.004=                                  | KPDES  |
| 4405   | KYG401197    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
|        |              | LAWCON                                  | Dwelling           |            |   | LIDDEC |
| 15635  | KYG401271    | LAWSON<br>RESIDENCE                     | Other than         | 0.0007736  | 0.0045                                  | KPDES  |
| 13033  | K1U4012/1    | RESIDENCE                               | Apartment Dwelling | 0.0007730  | 0.0045                                  | WLA    |
|        |              | WILLIAMSON                              | Other than         |            |   | KPDES  |
| 74022  | KYG401406    | RESIDENCE                               | Apartment          | 0.0007736  | 0.0045                                  | WLA    |
| 17022  | 121 0401400  | KESIDENCE                               | 2 sparament        | 0.0007730  | 0.00TJ                                  | W LA   |

|             |              |               |                        | Design    |                  |              |
|-------------|--------------|---------------|------------------------|-----------|------------------|--------------|
| AI          |              | Discharger    |                        | Capacity  | E. coli (billion |              |
| number      | KPDES#       | Facility Name | Туре                   | (cfs)     | colonies/day)    |              |
|             |              | •             | Dwelling               |           | •                |              |
|             |              | STUMBO        | Other than             |           |                  | KPDES        |
| 74025       | KYG401409    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
|             |              |               | Dwelling               |           |                  |              |
|             |              | MULLINS II    | Other than             |           |                  | KPDES        |
| 74062       | KYG401442    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
|             |              |               | Dwelling               |           |                  |              |
|             |              | TACKETT       | Other than             |           |                  | KPDES        |
| 74181       | KYG401470    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
|             |              | 2.2           | Dwelling               |           |                  |              |
|             |              | COLLINS       | Other than             |           |                  | KPDES        |
| 1168        | KYG401516    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
|             |              | MOORE         | Dwelling               |           |                  | LADDEC       |
| 25007       | IZX/C/401522 | MOORE         | Other than             | 0.0007736 | 0.0045           | KPDES        |
| 35887       | KYG401533    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
|             |              | CAUDILL       | Dwelling<br>Other than |           |                  | LIDDEC       |
| 44695       | KYG401580    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | KPDES<br>WLA |
| 44093       | K1U401360    | RESIDENCE     | Dwelling               | 0.0007730 | 0.0045           | WLA          |
|             |              | DINGUS        | Other than             |           |                  | KPDES        |
| 45073       | KYG401582    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
| 43073       | K1 0401302   | RESIDENCE     | Dwelling               | 0.0007730 | 0.0043           | WLA          |
|             |              | GEARHEART     | Other than             |           |                  | KPDES        |
| 45396       | KYG401587    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
| 10070       |              |               | Dwelling               |           |                  | .,           |
|             |              | HALL          | Other than             |           |                  | KPDES        |
| 45070       | KYG401590    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
|             |              |               | Dwelling               |           |                  |              |
|             |              | WILLIAMSON    | Other than             |           |                  | KPDES        |
| 46144       | KYG401601    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
|             |              |               | Dwelling               |           |                  |              |
|             |              | DUFF          | Other than             |           |                  | KPDES        |
| 48864       | KYG401645    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
|             |              |               | Dwelling               |           |                  |              |
| 4000=       | WW. C. 10.   | COCHRAN       | Other than             | 0.000==== | 0.004=           | KPDES        |
| 48897       | KYG401646    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
|             |              | WORK          | Dwelling               |           |                  | LADDEC       |
| 10251       | VVC401654    | YORK          | Other than             | 0.0007726 | 0.0045           | KPDES        |
| 49354       | KYG401654    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
|             |              | BLANKENSHIP   | Dwelling<br>Other than |           |                  | KPDES        |
| 50021       | KYG401692    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
| 30021       | K1 0401072   | RESIDENCE     | Dwelling               | 0.0007730 | 0.0043           | WLA          |
|             |              | NEWMAN        | Other than             |           |                  | KPDES        |
| 71436       | KYG401809    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
| , , , , , , | 22 2 .01009  |               | Dwelling               |           |                  | ., 2         |
|             |              | COMBS         | Other than             |           |                  | KPDES        |
| 74243       | KYG401821    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |
|             |              |               | Dwelling               |           |                  |              |
|             |              | LITTLE        | Other than             |           |                  | KPDES        |
| 75141       | KYG401851    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA          |

| AI     |           | Discharger           |                                     | Design<br>Capacity | E. coli (billion |  |
|--------|-----------|----------------------|-------------------------------------|--------------------|------------------|--|
| number | KPDES#    | Facility Name        | Туре                                | (cfs)              | colonies/day)    |  |
| 79525  | KYG401931 | HARVEL<br>RESIDENCE  | Dwelling<br>Other than<br>Apartment | 0.0007736          | 0.0045           | KPDES<br>WLA                           |
| 81193  | KYG401970 | MARTIN<br>RESIDENCE  | Dwelling<br>Other than<br>Apartment | 0.0007736          | 0.0045           | KPDES<br>WLA                           |
| 82471  | KYG402002 | HOPKINS<br>RESIDENCE | Dwelling<br>Other than<br>Apartment | 0.0007736          | 0.0045           | KPDES<br>WLA                           |
| 103052 | KYG402117 | LITTLE<br>RESIDENCE  | Dwelling<br>Other than<br>Apartment | 0.0007736          | 0.0045           | KPDES<br>WLA                           |
|        |           |                      |                                     |                    | 3.0226           | Total<br>KPDES<br>WLA                  |
|        |           |                      | Addition to<br>MAF (sum of<br>cfs)  | 0.5147631          | 513.5661         | remainder                              |
|        |           |                      |                                     |                    | 5.1357           | Future<br>Growth<br>WLA <sup>(1)</sup> |
|        |           |                      |                                     |                    | 8.1582           | Total WLA                              |
|        |           |                      |                                     |                    | 508.4304         | LA                                     |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

## Legend ttp://kygeonet.ky.gov Streams Kentucky E. coli Sample Sites Prepared by: MDJ Section, KDOW Right Fork Beaver 30.3 to 33.4 6/24/10 Open Water Developed, Open Space Developed, Low Intensity Developed, Medium Intensity Developed, High Intensity Barren Land (Rock,Sand,Clay) Deciduous Forest Evergreen Forest Mixed Forest WHEELWRIGHT Shrub/Scrub Grasslands/Herbaceous Pasture/Hay Cultivated Crops Woody Wetlands Emergent Herbaceous Wetlands KPDES-permitted Sources Dwelling other than Apartment Wheelwright STP MAGOFFIN FLOYD PIKE

# 8.13 Right Fork Beaver Creek RM 30.3 to 33.4

Figure 8.14 Right Fork Beaver Creek RM 30.3 to 33.4

The Right Fork Beaver Creek at RM 30.3 is a fourth order stream located in the Upper Right Fork Beaver Creek subwatershed in Knott County (Figure 8.14). Information about the Right Fork Beaver Creek RM 30.3 to 33.4 subwatershed, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.51. It has a catchment of 16,909 acres (26.4 square miles) with an 83% forested and 5.3% developed land cover (Table 8.52). This subwatershed is entirely un-sewered. There is one stream water withdrawal in this subwatershed at RM 40.6 of Right Fork Beaver Creek (Table 8.53). Sampling data from site 13 is presented in Table 8.54 and TMDL allocations in Table 8.55.

Table 8.51 Right Fork Beaver Creek RM 30.3 to 33.4 Information

| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |         |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|---------|----------|
|        | Right             |           |          |           |                 |               |         |         |          |
|        | Fork              |           |          |           |                 |               |         |         |          |
| Right  | Beaver            |           |          |           |                 |               |         |         |          |
| Fork   | Creek             |           |          |           |                 |               |         |         |          |
| Beaver | 30.3 to           |           |          |           |                 |               |         |         |          |
| Creek  | 33.4              | 501863_04 | Knott    | 16908.97  | 26.42           | 4th order     |         |         |          |
|        |                   |           |          |           |                 |               |         |         |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from  | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 13     | 13                | 30.3      | 37.35989 | -82.78935 | 43.3            | 30.3          | 0.01083 | 0.41002 | 42.9008  |

Table 8.52 Right Fork Beaver Creek RM 30.3 to 33.4 Subwatershed Land Cover

| _                    |           | Watershed | % of   | Future |
|----------------------|-----------|-----------|--------|--------|
|                      | Watershed | Square    | Total  | Growth |
| Land Cover           | Acres     | Miles     | Area   | WLA %  |
| Open Water           | 11.12     | 0.02      | 0.07   |        |
| Developed            | 893.21    | 1.40      | 5.28   | 1.0    |
| Barren Land          | 265.50    | 0.41      | 1.57   |        |
| Forest/Shrubland     | 13956.50  | 21.81     | 82.54  |        |
| Grassland/Herbaceous | 1570.73   | 2.45      | 9.29   |        |
| Pasture/Hay          | 202.35    | 0.32      | 1.20   |        |
| Cultivated Crops     | 9.12      | 0.01      | 0.05   |        |
| Wetlands             | 0.44      | 0.00      | 0.00   |        |
| Totals               | 16908.97  | 26.42     | 100.00 |        |

Table 8.53 Right Fork Beaver Creek RM 30.3 to 33.4 Water Withdrawals

| AI     |                    | Withdrawal    | Withdrawal | Facility | Facility  |
|--------|--------------------|---------------|------------|----------|-----------|
| number | Source Description | Facility Name | (cfs)      | Latitude | Longitude |
|        |                    | ICG Knott Co  |            |          |           |
|        | RM 40.6 Right      | LLC (860-     |            |          |           |
| 2528   | Fork Beaver Creek  | 8012)         | 0.4100156  | 37.32166 | -82.80366 |
|        |                    | subtraction   |            |          |           |
|        |                    | from MAF      |            |          |           |
|        |                    | (sum of cfs)  | 0.4100156  |          |           |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

September, 2010

Table 8.54 Right Fork Beaver Creek RM 30.3 to 33.4 Data (Site 13)

|                               | E. coli<br>(colonies/100 | Flow     | Instantaneous Load (billion <u>E</u> . <u>coli</u> | Unit Area Load<br>(million <u>E</u> . <u>coli</u> |
|-------------------------------|--------------------------|----------|--|---|
| Collection Date               | mls)                     | (cfs)    | colonies/day)                                      | colonies/day/acre)                                |
| 05/15/07                      | 260                      | 18.872   | 120.05   | 7.10  |
| 05/30/07                      | 190                      | 1.976    | 9.19   | 0.54  |
| 06/13/07                      | 320                      | 4.861    | 38.06  | 2.25  |
| 06/27/07                      | 560                      | 55.059   | 754.35   | 44.61   |
| 07/10/07                      | 370                      | 1.537    | 13.91  | 0.82  |
| 7/10/07 (QA Sample)           | 330                      | 1.537    | N/A  | N/A   |
| 07/26/07                      | 1900                     | 14.412   | 669.94   | 39.62   |
| 08/17/07                      | 320                      | 1.384    | 10.84  | 0.64  |
| 08/31/07                      | 210                      | N/A      | N/A  | N/A   |
| 09/13/07                      | 110                      | 1.829    | 4.92   | 0.29  |
| 09/28/07                      | 110                      | 0.59     | 1.59   | 0.09  |
| 10/12/07                      | <10                      | 0.612    | 0.15   | 0.01  |
| 10/12/07 (QA Sample)          | <10                      | 0.612    | 0.15   | 0.01  |
| 11/16/07 (outside PCR season) | 430                      | 1.4244   | 14.99  | 0.89  |
| Greatest Concentration        | 1900                     | 2, 12 11 | 11.77  | 0.07  |

Table 8.55 TMDL for Right Fork Beaver Creek RM 30.3 to 33.4

| 1 able 8.33 1 | MIDL IOI KIGII | it Fork Beaver                    | CIEEK KIVI S                          | 0.5 10 55.4                 |   |   |
|---------------|----------------|-----------------------------------|---------------------------------------|-----------------------------|---|---|
| TMDL<br>Table |                |                                   |                                       |                             | E. <u>coli</u><br>(billion<br>colonies/day) |   |
| Twore         |                |                                   |                                       |                             | 1994.2419                                   | Existing<br>Load                                |
|               |                |                                   |                                       |                             | 251.9042                                    | Total<br>TMDL                                   |
|               |                |                                   |                                       |                             | 25.1904                                     | MOS   |
|               |                |                                   |                                       |                             | 226.7138                                    | TMDL<br>Target                                  |
| AI<br>number  | KPDES#         | Discharger<br>Facility<br>Name    | Туре                                  | Design<br>Capacity<br>(cfs) | 88.63                                       | % reduction                                     |
| 33945         | KY0077542      | BEAVER<br>CREEK<br>ELEM<br>SCHOOL | School                                | 0.0108306                   | 0.0636                                      | KPDES<br>WLA                                    |
|               |                |                                   | Addition<br>to MAF<br>(sum of<br>cfs) | 0.0108306                   | 226.6502                                    | remainder                                       |
|               |                |                                   |                                       |                             | 2.2665                                      | Future<br>Growth<br>WLA <sup>(1)</sup><br>Total |
|               |                |                                   |                                       |                             | 2.3301<br>224.3837                          | WLA<br>LA                                       |
|               |                |                                   |                                       |                             | 44.3037                                     | LA  |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

### 8.14 Caney Fork RM 0.0 to 7.5

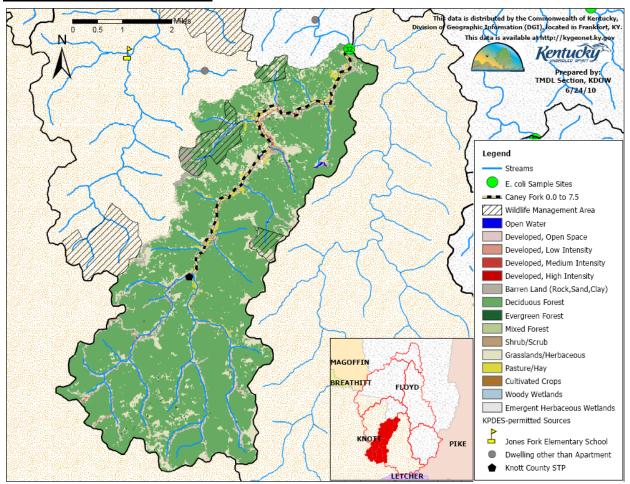


Figure 8.15 Caney Fork RM 0.0 to 7.5

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 33 is under site 32.

Caney Fork is a third order stream located in the Middle Right Fork Beaver Creek subwatershed in Knott County (Figure 8.15). Information about Caney Fork, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.56. It has a catchment of 15,657.3 acres (24.5 square miles) with an 80% forested and 4.7% developed land cover (Table 8.57). Portions of this subwatershed in the headwaters around Alice Lloyd College are sewered (Figure 8.16). There are several wildlife management areas in this subwatershed. There is one stream water withdrawal in this subwatershed at RM 4.2 of Caney Creek (Table 8.58). Sampling data from site 32 is presented in Table 8.59 and TMDL allocations in Table 8.60.

Table 8.56 Caney Fork RM 0.0 to 7.5 Information

| 10010 0       | e e currey                  | 1 0111 11111 | 0.0 to 7.5 | 11110111100010 |                 |               |         |         |          |
|---------------|-----------------------------|--------------|------------|----------------|-----------------|---------------|---------|---------|----------|
| Stream        | Stream<br>Segment           | WBID#        | County     | Acres          | Square<br>Miles | Stream Order  |         |         |          |
| Caney<br>Fork | Caney<br>Fork 0.0<br>to 7.5 | 48862 01     | Knott      | 15657.29       | 24.47           | 3rd order     |         |         |          |
| TOIK          | 10 7.5                      | 40002_01     | Kilott     | 13037.27       | 27.7/           | Jid Older     |         | l       |          |
|               |                             |              |            |                |                 |               |         |         |          |
|               |                             |              | Sample     | Sample         |                 |               | + to    | - from  | Adjusted |
| EKU           | MAP                         | Sample       | Site       | Site           | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site #        | Site #                      | Point RM     | Latitude   | Longitude      | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 32            | 32                          | 0.05         | 37.41672   | -82.79799      | 33.4            | 0             | 0.15472 | 1.00570 | 32.5490  |

Table 8.57 Caney Fork RM 0.0 to 7.5 Subwatershed Land Cover

| Land Cover           | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 8.89      | 0.01         | 0.06       |               |
| Developed            | 735.26    | 1.15         | 4.70       | 0.5           |
| Barren Land          | 248.35    | 0.39         | 1.59       |               |
|                      |           |              |            |               |
| Forest/Scrubland     | 12464.78  | 19.48        | 79.61      |               |
| Grassland/Herbaceous | 1933.87   | 3.02         | 12.35      |               |
| Pasture/Hay          | 258.80    | 0.40         | 1.65       |               |
| Cultivated Crops     | 6.45      | 0.01         | 0.04       |               |
| Wetlands             | 0.89      | 0.00         | 0.01       |               |
| Totals               | 15657.29  | 24.46        | 100.00     |               |

Table 8.58 Caney Fork RM 0.0 to 7.5 Water Withdrawals

| AI<br>number | Source<br>Description    | Withdrawal Facility<br>Name       | Withdrawal (cfs) | Facility<br>Latitude | Facility<br>Longitude |
|--------------|--------------------------|-----------------------------------|------------------|----------------------|-----------------------|
| 3502         | RM 4.2 of<br>Caney Creek | ICG Knott Co LLC                  | 1.005699         | 37.3884              | -82.82856             |
|              |                          | subtraction from MAF (sum of cfs) | 1.005699         |                      |                       |

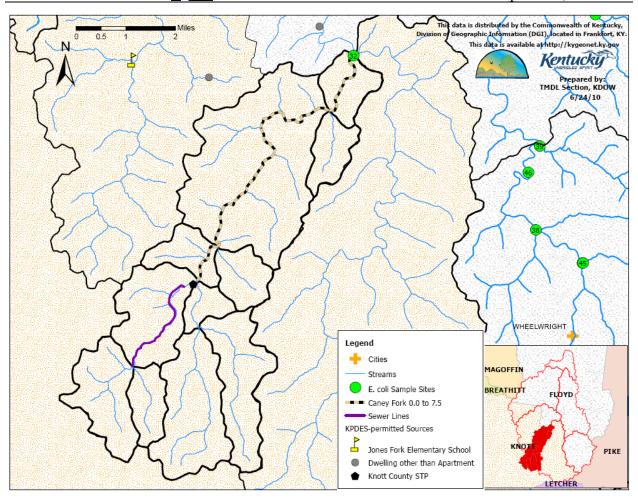


Figure 8.16 Caney Fork Sewer Lines

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 33 is under site 32.

Table 8.59 Caney Fork RM 0.0 to 7.5 Data (Site 32)

| Tuble 6.59 Euroy Fork February 6.6 to | E. coli       |            | Instantaneous Load              | Unit Area Load                  |
|---------------------------------------|---------------|------------|---------------------------------|---------------------------------|
|                                       | (colonies/100 |            | (billion <u>E</u> . <u>coli</u> | (million <u>E</u> . <u>coli</u> |
| Collection Date                       | mls)          | Flow (cfs) | colonies/day)                   | colonies/day/acre)              |
| 05/15/07                              | 100           | 151.9515   | 371.76                          | 23.74                           |
| 05/30/07                              | 300           | 4.797      | 35.21                           | 2.25                            |
| 06/13/07                              | 110           | 2.131      | 5.74                            | 0.37                            |
| 06/27/07                              | 430           | 5.698      | 59.94                           | 3.83                            |
| 07/10/07                              | 210           | 1.233      | 6.33                            | 0.40                            |
| 07/26/07                              | 690           | 20.379     | 344.03                          | 21.97                           |
| 08/17/07                              | 400           | 1.705      | 16.69                           | 1.07                            |
| 08/31/07                              | 260           | N/A        | N/A                             | N/A                             |
| 09/14/07                              | 170           | 0.105      | 0.44                            | 0.03                            |
| 09/28/07                              | 30            | 0.084      | 0.06                            | 0.00                            |
| 10/12/07                              | <10           | 0.275      | 0.07                            | 0.00                            |
| 11/16/07 (outside PCR season)         | 710           | 1.2337     | 21.43                           | 1.37                            |
| Greatest Concentration                | 690           |            |                                 |                                 |

Table 8.60 TMDL for Caney Fork RM 0.0 to 7.5

| uoic 0.00 i  | WIDE for Carr | ey Fork Kivi O.C                     | 7 10 7.5           |                             |                                    |  |
|--------------|---------------|--------------------------------------|--------------------|-----------------------------|------------------------------------|--|
| TMDL         |               |                                      |                    |                             | <u>E</u> . <u>coli</u><br>(billion |  |
| Table        |               |                                      |                    |                             | colonies/day)                      |  |
|              |               |                                      |                    |                             | 549.4722                           | Existing<br>Load                       |
|              |               |                                      |                    |                             | 191.1208                           | Total<br>TMDL                          |
|              |               |                                      |                    |                             | 19.1121                            | MOS                                    |
|              |               |                                      |                    |                             | 172.0087                           | TMDL<br>Target                         |
| AI<br>number | KPDES#        | Discharger<br>Facility<br>Name       | Туре               | Design<br>Capacity<br>(cfs) | 68.70                              | % reduction                            |
| 2527         | KY0042854     | KNOTT CO<br>WATER &<br>SEWER<br>DIST | Sewerage<br>System | 0.1547229                   | 0.9085                             | KPDES<br>WLA                           |
|              |               |                                      | Addition           |                             |                                    |  |
|              |               |                                      | to MAF             |                             |                                    |  |
|              |               |                                      | (sum of cfs)       | 0.1547229                   | 171.1002                           | remainder                              |
|              |               |                                      |                    |                             | 0.8555                             | Future<br>Growth<br>WLA <sup>(1)</sup> |
|              |               |                                      |                    |                             | 1.764                              | Total<br>WLA                           |
|              |               |                                      |                    |                             | 170.2447                           | LA                                     |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

#### 8.15 Jones Fork RM 0.0 to 9.9

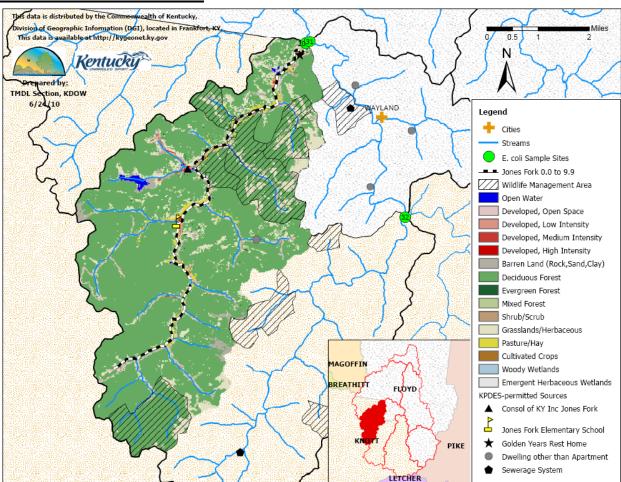


Figure 8.17 Jones Fork RM 0.0 to 9.9

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 20 is under site 31 and site 33 is under site 32.

Jones Fork is a third order stream located in the Middle Right Fork Beaver Creek subwatershed in Knott County (Figure 8.17). Information about Jones Fork, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.61. It has a catchment of 14,630.2 acres (2.9 square miles) with an 80% forested and 3.8% developed land cover (Table 8.62). This subwatershed is entirely un-sewered. There are several wildlife management areas in this subwatershed. There are no stream water withdrawals in this subwatershed. Sampling data from site 20 is presented in Table 8.63 and TMDL allocations in Table 8.64.

Table 8.61 Jones Fork RM 0.0 to 9.9 Information

| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |        |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|--------|----------|
| Jones  | Jones<br>Fork 0.0 |           |          |           |                 |               |         |        |          |
| Fork   | to 9.9            | 495499_01 | Knott    | 14630.21  | 22.86           | 3rd order     |         |        |          |
|        |                   |           |          |           |                 |               |         |        |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF    | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)  | (cfs)    |
| 20     | 20                | 0.05      | 37.46684 | -82.83148 | 30.8            | 0             | 0.03017 | 0      | 30.8302  |

Table 8.62 Jones Fork RM 0.0 to 9.9 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 52.70     | 0.08         | 0.36       |               |
| Developed            | 556.14    | 0.87         | 3.80       | 0.5           |
| Barren Land          | 344.00    | 0.54         | 2.35       |               |
| Forest/Shrubland     | 11649.82  | 18.20        | 79.63      |               |
| Grassland/Herbaceous | 1716.23   | 2.68         | 11.73      |               |
| Pasture/Hay          | 293.52    | 0.46         | 2.01       |               |
| Cultivated Crops     | 16.68     | 0.03         | 0.11       |               |
| Wetlands             | 1.11      | 0.00         | 0.01       |               |
| Totals               | 14630.21  | 22.86        | 100.00     |               |

Table 8.63 Jones Fork RM 0.0 to 9.9 Data (Site 20)

|                        | E. coli       |       | Instantaneous Load              | Unit Area Load                  |
|------------------------|---------------|-------|---------------------------------|---------------------------------|
|                        |               | T-1   |                                 |                                 |
|                        | (colonies/100 | Flow  | (billion <u>E</u> . <u>coli</u> | (million <u>E</u> . <u>coli</u> |
| Collection Date        | mls)          | (cfs) | colonies/day)                   | colonies/day/acre)              |
| 05/15/07               | 140           | 1.219 | 4.18                            | 0.29                            |
| 05/30/07               | 320           | 3.587 | 28.08                           | 1.92                            |
| 06/13/07               | 280           | 2.101 | 14.39                           | 0.98                            |
| 06/27/07               | 3100          | 2.128 | 161.40                          | 11.03                           |
| 07/10/07               | 370           | 1.062 | 9.61                            | 0.66                            |
| 07/26/07               | 4300          | 4.294 | 451.74                          | 30.88                           |
| 08/17/07               | 20            | 0.455 | 0.22                            | 0.02                            |
| 08/31/07               | 290           | 0.217 | 1.54                            | 0.11                            |
| 09/14/07               | 180           | 0.304 | 1.34                            | 0.09                            |
| 9/14/07 (QA/Sample)    | 70            | N/A   | N/A                             | N/A                             |
| 09/28/07               | 170           | 0.107 | 0.45                            | 0.03                            |
| 10/12/07               | <10           | 0.035 | 0.01                            | 0.00                            |
| 11/16/07 (outside PCR  |               |       |                                 |                                 |
| season)                | 120           | 4.091 | 12.01                           | 0.82                            |
| Greatest Concentration | 4300          |       |                                 |                                 |

Table 8.64 TMDL for Jones Fork RM 0.0 to 9.9

| 1 4010 8.0 |            | nes Fork Rivi U. | 1 10 9.9     |                | ъ 1           |   |
|------------|------------|------------------|--------------|----------------|---------------|---|
| T) (5)     |            |                  |              |                | E. coli       |   |
| TMDL       |            |                  |              |                | (billion      |   |
| Table      |            |                  |              |                | colonies/day) |   |
|            |            |                  |              |                |               | Existing                                |
|            |            |                  |              |                | 3243.4191     | Load                                    |
|            |            |                  |              |                |               | Total                                   |
|            |            |                  |              |                | 181.0280      | TMDL                                    |
|            |            |                  |              |                | 18.1028       | MOS                                     |
|            |            |                  |              |                | 1011020       |   |
|            |            |                  |              |                | 1.60.0050     | TMDL                                    |
|            |            |                  |              |                | 162.9252      | Target                                  |
|            |            | Discharger       |              |                |               |   |
| AI         |            | Facility         |              | Design         |               | %                                       |
| number     | KPDES#     | Name             | Type         | Capacity (cfs) | 94.98         | reduction                               |
|            |            | JONES            |              |                |               |   |
|            |            | FORK             |              |                |               |   |
|            |            | ELEM             |              |                |               | KPDES                                   |
| 35359      | KY0087076  | SCHOOL           | School       | 0.0092834      | 0.0545        | WLA                                     |
|            |            | 2 0 0 0 0 0      |              |                | 0000 10       | , , ,                                   |
|            |            |                  | Dwelling     |                |               |   |
|            |            | CHILDERS         | Other than   |                |               | KPDES                                   |
| 46147      | KYG401603  | RESIDENCE        | Apartment    | 0.0007736      | 0.0045        | WLA                                     |
|            |            | CONSOL           |              |                |               |   |
|            |            | OF KY INC        | Bituminous   |                |               |   |
|            |            | JONES            | Coal & Lig,  |                |               | KPDES                                   |
| 2514       | KY0094510  | FORK             | Surface      | 0.0046417      | 0.0273        | WLA                                     |
|            | 1110031010 | GOLDEN           | 2011000      | 0.0010117      | 0002.0        | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
|            |            | YEARS            | Intermediate |                |               |   |
|            |            | REST             | Care         |                |               | KPDES                                   |
| 2517       | KY0083089  | HOME             | Facility     | 0.0154723      | 0.0908        | WLA                                     |
| 2317       | K10003009  | HOWIE            | raciity      | 0.0134723      | 0.0700        | Total                                   |
|            |            |                  |              |                |               |   |
|            |            |                  |              |                | 0.1551        | KPDES                                   |
|            |            |                  | A 11'.       |                | 0.1771        | WLA                                     |
|            |            |                  | Addition to  |                |               |   |
|            |            |                  | MAF (sum     |                |               |   |
|            |            |                  | of cfs)      | 0.0301710      | 162.7481      | remainder                               |
|            |            |                  |              |                |               | Future                                  |
|            |            |                  |              |                |               | Growth                                  |
|            |            |                  |              |                | 0.8137        | $\mathbf{WLA}^{(1)}$                    |
|            |            |                  |              |                |               | Total                                   |
|            |            |                  |              |                | 0.9908        | WLA                                     |
|            |            |                  |              |                | 161.9343      | LA                                      |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

#### Commonwealth of Kentucky. (DGI), located in Frankfort, KY at http://kygeonet.ky.gov Legend Cities *lentucků* Streams ction, KDOW E. coli Sample Sites Right Fork Beaver 17.4 to 23.3 ■ Right Fork Beaver 23.3 to 30.3 Right Fork Beaver 30.3 to 33.4 Caney Fork 0.0 to 7.5 Elk Release Site Wildlife Management Area Open Water Developed, Open Space Developed, Low Intensity Developed, Medium Intensity Developed, High Intensity Barren Land (Rock, Sand, Clav) Deciduous Forest Evergreen Forest Mixed Forest BREATHITT Shrub/Scrub Grasslands/Herbaceous Pasture/Hay Cultivated Crops Woody Wetlands Emergent Herbaceous Wetlands KPDES-permitted Sources Dwelling other than Apartment McDowell Dollar General Store School \* Golden Years Rest Home S & V MHP Left Beaver Creek Townhouses Sewerage Systems McDowell Appalachian Regional Hospital

# 8.16 Right Fork Beaver Creek RM 17.4 to 23.3

Figure 8.18 Right Fork Beaver Creek RM 17.4 to 23.3

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 32 is under site 33, site 20 is under site 31, and site 40 is under site 47.

Right Fork Beaver Creek at RM 17.4 is a fourth order stream located in Floyd County (Figure 8.18). Its subwatershed encompasses the entire Upper and portions of the Middle Right Fork Beaver Creek subwatersheds. Information about Right Fork Beaver Creek RM 17.4 to 23.3, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.65. It has a catchment of 49,402 acres (77.2 square miles) with an 81% forested and 5.4% developed land cover (Table 8.66). Portions of this subwatershed around Pippa Passes, Alice Lloyd College, and Wayland are sewered (see Figure 5.18). There are three stream water withdrawals in this subwatershed (Table 8.67). Sampling data from site 31 is presented in Table 8.68 and TMDL allocations in Table 8.69.

Table 8.65 Right Fork Beaver Creek RM 17.4 to 23.3 Information

|        |         | I OIR Beave |          |           |        |               | 1       |         |          |
|--------|---------|-------------|----------|-----------|--------|---------------|---------|---------|----------|
|        | Stream  |             |          |           | Square |               |         |         |          |
| Stream | Segment | WBID#       | County   | Acres     | Miles  | Stream Order  |         |         |          |
|        | Right   |             |          |           |        |               |         |         |          |
|        | Fork    |             |          |           |        |               |         |         |          |
| Right  | Beaver  |             |          |           |        |               |         |         |          |
| Fork   | Creek   |             |          |           |        |               |         |         |          |
| Beaver | 17.4 to |             |          |           |        |               |         |         |          |
| Creek  | 23.3    | 501863_02   | Floyd    | 49402.07  | 77.19  | 4th order     |         |         |          |
|        |         |             |          |           |        |               |         |         |          |
|        |         |             | Sample   | Sample    |        |               | + to    | - from  | Adjusted |
| EKU    | MAP     | Sample      | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #  | Point RM    | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs)   | (cfs)    |
| 31     | 31      | 17.5        | 37.46730 | -82.83000 | 104.7  | 17.4          | 0.32260 | 1.43119 | 103.5914 |

Table 8.66 Right Fork Beaver Creek RM 17.4 to 23.3 Subwatershed Land Cover

| Land Cover           | Watershed<br>Acres | Watershed<br>Square Miles | % of Total<br>Area | Future Growth WLA % |
|----------------------|--------------------|---------------------------|--------------------|---------------------|
| Open Water           | 20.46              | 0.03                      | 0.04               |                     |
| Developed            | 2666.57            | 4.17                      | 5.40               | 1.0                 |
| Barren Land          | 623.28             | 0.97                      | 1.26               |                     |
| Forest/Shrubland     | 39856.27           | 62.28                     | 80.68              |                     |
| Grassland/Herbaceous | 5325.58            | 8.32                      | 10.78              |                     |
| Pasture/ Hay         | 877.00             | 1.37                      | 1.78               |                     |
| Cultivated Crops     | 28.68              | 0.04                      | 0.06               |                     |
| Wetlands             | 4.22               | 0.01                      | 0.01               |                     |
|                      | 49402.07           | 77.19                     | 100.00             |                     |

Table 8.67 Right Fork Beaver Creek RM 17.4 to 23.3 Water Withdrawals

| AI     | Source                   | Withdrawal          | Withdrawal | Facility | Facility  |
|--------|--------------------------|---------------------|------------|----------|-----------|
| number | Description              | Facility Name       | (cfs)      | Latitude | Longitude |
|        | RM 40.6                  |                     |            |          |           |
|        | Right Fork               | ICG Knott Co        |            |          |           |
|        | Beaver                   | LLC (860-           |            |          |           |
| 2528   | Creek                    | 8012)               | 0.4100156  | 37.32166 | -82.80366 |
|        | RM 31.0                  |                     |            |          |           |
|        | Right Fork               | Deane Mining        |            |          |           |
|        | Beaver                   | LLC (860-           |            |          |           |
| 2525   | Creek                    | 5318)               | 0.01547229 | 37.41038 | -82.78096 |
| 3502   | RM 4.2 of<br>Caney Creek | ICG Knott Co<br>LLC | 1.005699   | 37.3884  | -82.82856 |
|        |                          | subtraction         |            |          |           |
|        |                          | from MAF            |            |          |           |
|        |                          | (sum of cfs)        | 1.4311869  |          |           |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

September, 2010

Table 8.68 Right Fork Beaver Creek RM 17.4 to 23.3 Data (Site 31)

| Collection Date        | E. coli<br>(colonies/100<br>mls) | Flow (cfs) | Instantaneous Load (billion <u>E</u> . coli colonies/day) | Unit Area Load (million <u>E</u> . <u>coli</u> colonies/day/acre) |
|------------------------|----------------------------------|------------|---|---|
| 05/15/07               | 180                              | 3.172      | 13.97   | 0.28  |
| 05/30/07               | 200                              | 3.587      | 17.55   | 0.36  |
| 06/13/07               | 300                              | 10.346     | 75.94   | 1.54  |
| 06/27/07               | 4100                             | 16.049     | 1609.87   | 32.59   |
| 07/10/07               | 150                              | N/A        | N/A   | N/A   |
| 07/26/07               | 2900                             | 41.221     | 2924.66   | 59.20   |
| 08/17/07               | 430                              | 4.732      | 49.78   | 1.01  |
| 08/31/07               | 150                              | 2.551      | 9.36  | 0.19  |
| 09/14/07               | 220                              | 2.619      | 14.10   | 0.29  |
| 09/28/07               | 110                              | 1.429      | 3.85  | 0.08  |
| 9/28/27 (QA Sample)    | 70                               | N/A        | N/A   | N/A   |
| 10/12/07               | 70                               | 1.481      | 2.54  | 0.05  |
| 11/16/07 (outside PCR  |                                  |            |   |   |
| season)                | 180                              | 18.054     | 79.51   | 1.61  |
| Greatest Concentration | 4100                             |            |   |   |

Table 8.69 TMDL for Right Fork Beaver Creek RM 17.4 to 23.3

|        |                | agnt Fork Beav | Vei Cieek Ki | VI 17.4 to 23 |                  |                    |
|--------|----------------|----------------|--------------|---------------|------------------|--------------------|
| TMDL   |                |                |              |               | E. coli (billion |                    |
| Table  |                |                |              |               | colonies/day)    | <b>T</b>           |
|        |                |                |              |               | 10201 0120       | Existing           |
|        |                |                |              |               | 10391.2139       | Load               |
|        |                |                |              |               | 600.0660         | Total              |
|        |                |                |              |               | 608.2662         | TMDL               |
|        |                |                |              |               | 60.8266          | MOS                |
|        |                |                |              |               |                  | TMDL               |
|        |                |                |              |               | 547.4396         | Target             |
|        |                | Discharger     |              | Design        |                  |                    |
| AI     |                | Facility       |              | Capacity      |                  | %                  |
| number | KPDES#         | Name           | Type         | (cfs)         | 94.73            | reduction          |
|        |                | KNOTT CO       |              |               |                  |                    |
|        |                | WATER &        |              |               |                  |                    |
|        |                | SEWER          | Sewerage     |               |                  | KPDES              |
| 2527   | KY0042854      | DIST           | System       | 0.1547229     | 0.9085           | WLA                |
|        |                | BEAVER         |              |               |                  |                    |
|        |                | CREEK          |              |               |                  |                    |
|        |                | ELEM           |              |               |                  | KPDES              |
| 33945  | KY0077542      | SCHOOL         | School       | 0.0108306     | 0.0636           | WLA                |
|        |                |                | Dwelling     |               |                  |                    |
|        |                | PERKINS        | Other than   |               |                  | KPDES              |
| 1293   | KYG400836      | RESIDENCE      | Apartment    | 0.0007736     | 0.0045           | WLA                |
|        |                |                | Dwelling     |               |                  |                    |
|        |                | CRUM           | Other than   |               |                  | KPDES              |
| 4336   | KYG401125      | RESIDENCE      | Apartment    | 0.0007736     | 0.0045           | WLA                |
|        |                | WAYLAND        | Sewerage     |               |                  | KPDES              |
| 35761  | KY0105228      | STP            | System       | 0.1547229     | 0.9085           | WLA                |
|        |                |                | Dwelling     |               |                  | TIPD TO            |
| 10.40  | 1717 G 40001 F | KESTER         | Other than   | 0.0007736     | 0.004            | KPDES              |
| 1243   | KYG400915      | RESIDENCE      | Apartment    | 0.0007736     | 0.0045           | WLA                |
|        |                |                |              |               |                  | Total              |
|        |                |                |              |               | 1 0041           | KPDES              |
|        |                |                | A 11'4'      |               | 1.8941           | WLA                |
|        |                |                | Addition     |               |                  |                    |
|        |                |                | to MAF       |               |                  |                    |
|        |                |                | (sum of cfs) | 0.3225972     | 545.5453         | remainder          |
|        |                |                | C18)         | 0.3223912     | 343.3433         | Future             |
|        |                |                |              |               |                  | Growth             |
|        |                |                |              |               | 5.4555           | WLA <sup>(1)</sup> |
|        |                |                |              |               | 3,4333           | Total              |
|        |                |                |              |               | 7.3496           | WLA                |
|        |                |                |              |               |                  |                    |
|        |                |                |              |               | 540.0899         | LA                 |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

# 8.17 Salt Lick Creek RM 0.0 to 6.8

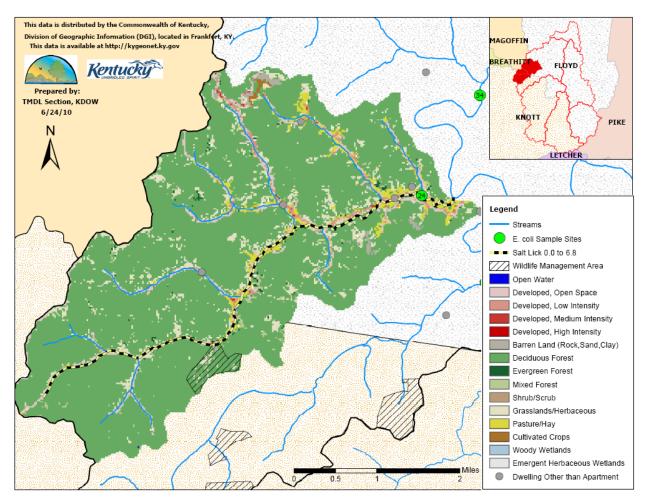


Figure 8.19 Salt Lick Creek RM 0.0 to 6.8

Salt Lick Creek is a third order stream located in the Middle Right Fork Beaver Creek subwatershed in Floyd County (Figure 8.19). Information about Salt Lick Creek, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.70. It has a catchment of 8,114.4 acres (12.7 square miles) with an 84% forested and 5.4% developed land cover (Table 8.71). This subwatershed is entirely un-sewered. There are no stream water withdrawals in this subwatershed. Sampling data from site 24 is presented in Table 8.72 and TMDL allocations in Table 8.73.

Table 8.70 Salt Lick Creek RM 0.0 to 6.8 Information

|        | word on a swit Eight eight fact and a die information |           |          |           |        |               |         |         |          |  |
|--------|---|-----------|----------|-----------|--------|---------------|---------|---------|----------|--|
|        | Stream  |           |          |           | Square |               |         |         |          |  |
| Stream | Segment   | WBID#     | County   | Acres     | Miles  | Stream Order  |         |         |          |  |
|        | Salt  |           |          |           |        |               |         |         |          |  |
|        | Lick  |           |          |           |        |               |         |         |          |  |
| Salt   | Creek   |           |          |           |        |               |         |         |          |  |
| Lick   | 0.0 to  |           |          |           |        |               |         |         |          |  |
| Creek  | 6.8   | 502845_01 | Floyd    | 8114.44   | 12.68  | 3rd order     |         |         |          |  |
|        |   |           | Sample   | Sample    |        |               | + to    | - from  | Adjusted |  |
| EKU    | MAP   | Sample    | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF     | MAF      |  |
| Site # | Site #  | Point RM  | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs)   | (cfs)    |  |
| 24     | 24  | 0.65      | 37.49563 | 82.84959  | 16.8   | 0             | 0.00387 | 0.00000 | 16.8039  |  |

Table 8.71 Salt Lick Creek RM 0.0 to 6.8 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 0.22      | 0.00         | 0.00       |               |
| Developed            | 435.28    | 0.68         | 5.36       | 1.0           |
| Barren Land          | 53.60     | 0.08         | 0.66       |               |
| Forest/Shrubland     | 6807.70   | 10.64        | 83.90      |               |
| Grassland/Herbaceous | 546.49    | 0.85         | 6.73       |               |
| Pasture/Hay          | 250.89    | 0.39         | 3.09       |               |
| Cultivated Crops     | 18.46     | 0.03         | 0.23       |               |
| Wetlands             | 1.78      | 0.00         | 0.02       |               |
| Totals               | 8114.44   | 12.68        | 100.00     |               |

Table 8.72 Salt Lick Creek RM 0.0 to 6.8 Data (Site 24)

|                        | E. coli            | Flow  | Instantaneous<br>Load (billion E. | Unit Area Load<br>(million E. coli |
|------------------------|--------------------|-------|-----------------------------------|------------------------------------|
| Collection Date        | (colonies/100 mls) | (cfs) | <u>coli</u> colonies/day)         | colonies/day/acre)                 |
| 05/15/07               | 4100               | 1.608 | 161.30                            | 19.88                              |
| 05/30/07               | 755                | 1.035 | 19.12                             | 2.36                               |
| 06/13/07               | 48000              | 0.299 | 351.13                            | 43.27                              |
| 06/27/07               | 66000              | 1.504 | 2428.57                           | 299.29                             |
| 07/10/07               | 800                | 0.117 | 2.29                              | 0.28                               |
| 07/26/07               | 1400               | 0.596 | 20.41                             | 2.52                               |
| 08/17/07               | 90                 | N/A   | N/A                               | N/A                                |
| 08/31/07               | 10                 | N/A   | N/A                               | N/A                                |
| 8/31/07 (QA Sample)    | 30                 | N/A   | N/A                               | N/A                                |
| 09/14/07               | 28000              | N/A   | N/A                               | N/A                                |
| 09/28/07               | 140                | N/A   | N/A                               | N/A                                |
| 11/16/07 (outside PCR  |                    |       |                                   |                                    |
| season)                | 1100               | N/A   | N/A                               | N/A                                |
| Greatest Concentration | 66000              |       |                                   | _                                  |

Table 8.73 TMDL for Salt Lick Creek RM 0.0 to 6.8

| Table 8.7.  | 5 INIDL IOI Sa | iit Lick Creek R | WI U.U 10 0.8 |           | •                      |                |
|-------------|----------------|------------------|---------------|-----------|------------------------|----------------|
|             |                |                  |               |           | <u>E</u> . <u>coli</u> |                |
| TMDL        |                |                  |               |           | (billion               |                |
| Table       |                |                  |               |           | colonies/day)          |                |
| 14310       |                |                  |               |           | coronies, day)         | Existing       |
|             |                |                  |               |           | 27133.8788             | Load           |
|             |                |                  |               |           | 2/133.0700             |                |
|             |                |                  |               |           | 00.6605                | Total          |
|             |                |                  |               |           | 98.6687                | TMDL           |
|             |                |                  |               |           | 9.8669                 | MOS            |
|             |                |                  |               |           |                        | TMDL           |
|             |                |                  |               |           | 88.8018                | Target         |
|             |                | Discharger       |               | Design    |                        |                |
| AI          |                | Facility         |               | Capacity  |                        | %              |
| number      | KPDES#         | Name             | Type          | (cfs)     | 99.67                  | reduction      |
| 110,1110,01 | 111 2 20 11    | 1,001110         | Dwelling      | (515)     | 77.07                  |                |
|             |                | HALL             | Other than    |           |                        | KPDES          |
| 74105       | KYG401475      |                  |               | 0.0007736 | 0.0045                 |                |
| 74185       | KYG4014/3      | RESIDENCE        | Apartment     | 0.0007736 | 0.0045                 | WLA            |
|             |                | *****            | Dwelling      |           |                        | ******         |
|             |                | KIDD             | Other than    |           |                        | KPDES          |
| 50950       | KYG401730      | RESIDENCE        | Apartment     | 0.0007736 | 0.0045                 | WLA            |
|             |                |                  | Dwelling      |           |                        |                |
|             |                | SHEPHERD         | Other than    |           |                        | KPDES          |
| 1314        | KYG400844      | RESIDENCE        | Apartment     | 0.0007736 | 0.0045                 | WLA            |
|             |                |                  | Dwelling      |           |                        |                |
|             |                | GREEN            | Other than    |           |                        | KPDES          |
| 1199        | KYG400603      | RESIDENCE        | Apartment     | 0.0007736 | 0.0045                 | WLA            |
| 11//        | K1040003       | RESIDENCE        | -             | 0.0007730 | 0.0043                 | WLA            |
|             |                | CACTIF           | Dwelling      |           |                        | LADDEC         |
| 12.50       | 1737 (7401112  | CASTLE           | Other than    | 0.000     | 0.0045                 | KPDES          |
| 4350        | KYG401113      | RESIDENCE        | Apartment     | 0.0007736 | 0.0045                 | WLA            |
|             |                |                  |               |           |                        | Total          |
|             |                |                  |               |           |                        | KPDES          |
|             |                |                  |               |           | 0.0225                 | WLA            |
|             |                |                  | Addition      |           |                        |                |
|             |                |                  | to MAF        |           |                        |                |
|             |                |                  | (sum of       |           |                        |                |
|             |                |                  | cfs)          | 0.0038681 | 88.7791                | remainder      |
|             |                |                  | <b>V1</b> 5)  | 3.0050001 | 00.7771                | Future         |
|             |                |                  |               |           |                        |                |
|             |                |                  |               |           | 0.0070                 | Growth WLA (1) |
|             |                |                  |               |           | 0.8878                 |                |
|             |                |                  |               |           | 0.0105                 | Total          |
|             |                |                  |               |           | 0.9103                 | WLA            |
|             |                |                  |               |           | 87.8913                | LA             |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

#### 8.18 Turkey Creek RM 0.0 to 5.9

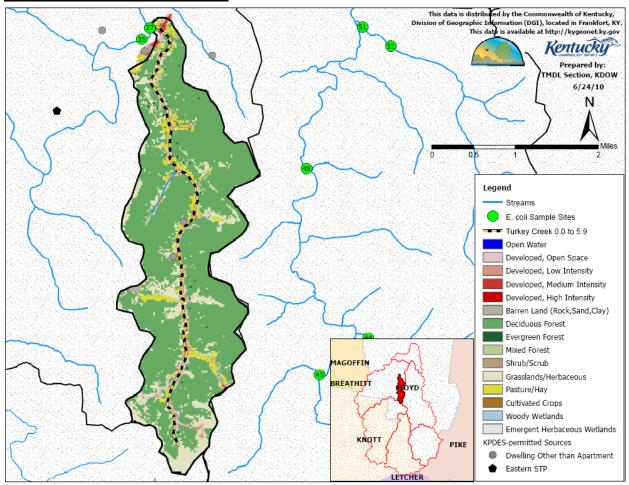


Figure 8.20 Turkey Creek RM 0.0 to 5.9

Turkey Creek is a second order stream located in the Lower Right Fork Beaver Creek subwatershed in Floyd County (Figure 8.20). Information about Turkey Creek, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.74. It has a catchment of 3,403 acres (5.3 square miles) with a 75% forested and 4.6% developed land cover (Table 8.75). This subwatershed is entirely un-sewered. There are no stream water withdrawals in this subwatershed. Sampling data from site 27 is presented in Table 8.76 and TMDL allocations in Table 8.77.

Table 8.74 Turkey Creek RM 0.0 to 5.9 Information

|        |                   | )         |          |           |                 |               | _       |         |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|---------|----------|
| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |         |          |
|        | Turkey            |           |          |           |                 |               |         |         |          |
|        | Creek             |           |          |           |                 |               |         |         |          |
| Turkey | 0.0 to            |           |          |           |                 |               |         |         |          |
| Creek  | 5.9               | 505598_01 | Floyd    | 3402.79   | 5.32            | 2nd order     |         |         |          |
|        |                   |           |          |           |                 |               |         |         |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from  | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 27     | 27                | 0.05      | 37.53184 | 82.78877  | 7               | 0             | 0.00232 | 0.00000 | 7.0023   |

Table 8.75 Turkey Creek RM 0.0 to 5.9 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 0.22      | 0.00         | 0.01       |               |
| Developed            | 157.05    | 0.25         | 4.62       | 0.5           |
| Barren Land          | 23.58     | 0.04         | 0.69       |               |
| Forest/Shrubland     | 2545.47   | 3.98         | 74.81      |               |
| Grassland/Herbaceous | 474.93    | 0.74         | 13.96      |               |
| Pasture/Hay          | 197.76    | 0.31         | 5.81       |               |
| Cultivated Crops     | 3.78      | 0.01         | 0.11       |               |
| Wetlands             | 0.00      | 0.00         | 0.00       |               |
| Total                | 3402.79   | 5.32         | 100.00     |               |

Table 8.76 Turkey Creek RM 0.0 to 5.9 Data (site 27)

|                        | E. coli<br>(colonies/100 | Flow    | Instantaneous<br>Load (billion E. | Unit Area Load (million E. coli |
|------------------------|--------------------------|---------|-----------------------------------|---------------------------------|
| Collection Date        | mls)                     | (cfs)   | <u>coli</u> colonies/day)         | colonies/day/acre)              |
| 05/16/07               | 1600                     | 10.6148 | 415.52                            | 122.11                          |
| 05/30/07               | 2400                     | 0.389   | 22.84                             | 6.71                            |
| 06/13/07               | 3300                     | 0.2     | 16.15                             | 4.75                            |
| 06/27/08               | 2900                     | 0.411   | 29.16                             | 8.57                            |
| 07/10/07               | 1100                     | 0.114   | 3.07                              | 0.90                            |
| 07/26/07               | 170                      | 0.156   | 0.65                              | 0.19                            |
| 08/17/07               | 59000                    | N/A     | N/A                               | N/A                             |
| 08/31/07               | 1000                     | N/A     | N/A                               | N/A                             |
| 09/14/07               | 16900                    | N/A     | N/A                               | N/A                             |
| 09/28/07               | 4600                     | N/A     | N/A                               | N/A                             |
| 10/12/07               | 3200                     | N/A     | N/A                               | N/A                             |
| 11/16/07 (outside PCR  |                          |         |                                   |                                 |
| season)                | 2800                     | 0.449   | 30.76                             | 9.04                            |
| Greatest Concentration | 59000                    |         |                                   |                                 |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

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Table 8.77 TMDL for Turkey Creek RM 0.0 to 5.9

| 1 aut 6.77 | TIVIDE IOI TUI | key Cleek Kivi | 0.0 10 3.7  | T           |                        |                      |
|------------|----------------|----------------|-------------|-------------|------------------------|----------------------|
|            |                |                |             |             | <u>E</u> . <u>coli</u> |                      |
|            |                |                |             |             | (billion               |                      |
| TMDL       |                |                |             |             | colonies/              |                      |
| Table      |                |                |             |             | day)                   |                      |
|            |                |                |             |             |                        | Existing             |
|            |                |                |             |             | 10107.7083             | Load                 |
|            |                |                |             |             |                        | Total                |
|            |                |                |             |             | 41.1161                | TMDL                 |
|            |                |                |             |             | 4.1116                 | MOS                  |
|            |                |                |             |             |                        | TMDL                 |
|            |                |                |             |             | 37.0045                | Target               |
|            |                | Discharger     |             | Design      |                        |                      |
| AI         |                | Facility       |             | Capacity    |                        | %                    |
| number     | KPDES#         | Name           | Туре        | (cfs)       | 99.63                  | reduction            |
| Hamou      | TH DES II      | 1 (dillo       | Dwelling    | (615)       | 77.03                  | reduction            |
|            |                | MULLINS        | Other than  |             |                        | KPDES                |
| 1276       | KYG400975      | RESIDENCE      | Apartment   | 0.000773615 | 0.0045                 | WLA                  |
| 1270       | K10400973      | RESIDENCE      | Dwelling    | 0.000773013 | 0.0043                 | VVLA                 |
|            |                | SCOTT          | Other than  |             |                        | KPDES                |
| 50627      | KYG401721      | RESIDENCE      |             | 0.000773615 | 0.0045                 | WLA                  |
| 30027      | K Y G401/21    | RESIDENCE      | Apartment   | 0.000773013 | 0.0045                 | WLA                  |
|            |                | ED A CLIDE     | Dwelling    |             |                        | LADDEC               |
| 42.44      | WWC401101      | FRASURE        | Other than  | 0.000773615 | 0.0045                 | KPDES                |
| 4344       | KYG401121      | RESIDENCE      | Apartment   | 0.000773615 | 0.0045                 | WLA                  |
|            |                |                |             |             |                        | Total                |
|            |                |                |             |             |                        | KPDES                |
|            |                |                |             |             | 0.0135                 | WLA                  |
|            |                |                | Addition to |             |                        |                      |
|            |                |                | MAF (sum    |             |                        |                      |
|            |                |                | of cfs)     | 0.002320844 | 36.9909                | remainder            |
|            |                |                |             |             |                        | Future               |
|            |                |                |             |             |                        | Growth               |
|            |                |                |             |             | 0.1850                 | $\mathbf{WLA}^{(1)}$ |
|            |                |                |             |             |                        | Total                |
|            |                |                |             |             | 0.1985                 | WLA                  |
|            |                |                |             |             | 36.8059                | LA                   |
|            |                |                |             |             | 20.0037                | <b>1</b> 11          |

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

PIKE

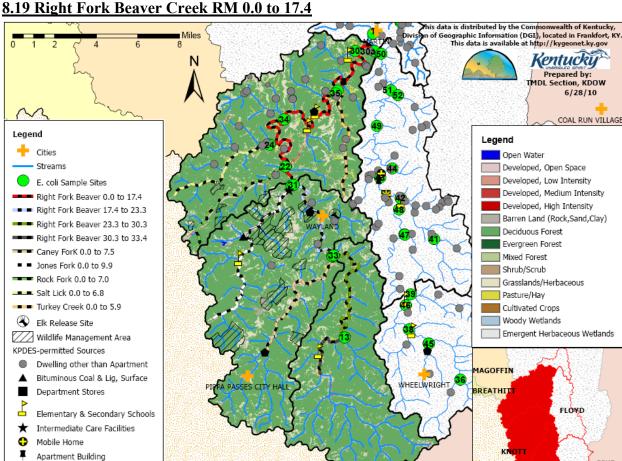


Figure 8.21 Right Fork Beaver Creek RM 0.0 to 17.4

Sewerage Systems Hospital

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 27 is under site 35, site 32 is under site 33, site 20 is under site 31, site 37 is under site 45, and site 40 is under site 47.

Right Fork Beaver Creek at RM 0.0 is a fourth order stream located in Floyd County (Figure 8.21). Its subwatershed encompasses the entire Upper, Middle, and Lower Right Fork Beaver Creek subwatersheds. Information about Right Fork Beaver Creek RM 0.0 to 17.4, including sample site locations, waterbody identification number (WBID), and MAF is shown in Table 8.78. It has a catchment of 99,096 acres (154.8 square miles) with a 79% forested and 6% developed land cover (Table 8.79). Portions of the subwatershed are sewered (see Figures 5.18 and 5.19). There are three stream water withdrawals in this subwatershed (Table 8.80). This segment had four sample sites and data from sites 30, 30a, 34, and 35 and is presented in Table 8.81. Site 30 had the greatest concentration (13,000) so this concentration was used to set the existing loads and percent reduction for the impaired segment. However, to extrapolate to the end of the impaired segment, the Adjusted MAF from site 30a (204.9477 cfs) was used as the flow to set the TMDL for this impaired segment. The TMDL calculations for sites 30, 30a, 34, and 35 are shown in Appendix E while the TMDL for Right Fork Beaver Creek RM 0.0 to 17.4 is shown in Table 8.82.

Table 8.78 Right Fork Beaver Creek RM 0.0 to 17.4 Information

|        | Stream  | TOTA Board |          |           | Square |               |         |         |          |
|--------|---------|------------|----------|-----------|--------|---------------|---------|---------|----------|
| Stream | Segment | WBID#      | County   | Acres     | Miles  | Stream Order  |         |         |          |
|        | Right   |            |          |           |        |               |         |         |          |
|        | Fork    |            |          |           |        |               |         |         |          |
| Right  | Beaver  |            |          |           |        |               |         |         |          |
| Fork   | Creek   |            |          |           |        |               |         |         |          |
| Beaver | 0.0 to  |            |          |           |        |               |         |         |          |
| Creek  | 17.4    | 501863_01  | Floyd    | 99095.56  | 154.84 | 4th order     |         |         |          |
|        |         |            |          |           |        |               |         |         |          |
|        |         |            | Sample   | Sample    |        |               | + to    | - from  | Adjusted |
| EKU    | MAP     | Sample     | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #  | Point RM   | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs)   | (cfs)    |
| 30     | 30      | 1.4        | 37.55905 | -82.77234 | 204.7  | 1.4           | 0.47809 | 1.43119 | 203.7469 |
| 30a    | 30a     | 0.2        | 37.55840 | -82.75550 | 205.9  | 0             | 0.47887 | 1.43119 | 204.9477 |
| 34     | 34      | 11.2       | 37.51286 | -82.83616 | 169.3  | 11.2          | 0.35818 | 1.43119 | 168.2270 |
| 35     | 35      | 5.7        | 37.52986 | -82.79064 | 189.1  | 5.7           | 0.43554 | 1.43119 | 188.1044 |

Table 8.79 Right Fork Beaver Creek RM 0.0 to 17.4 Subwatershed Land Cover

|                      | Watershed | Watershed    |                 | Future Growth |
|----------------------|-----------|--------------|-----------------|---------------|
| Land Cover           | Acres     | Square Miles | % of Total Area | WLA %         |
| Open Water           | 76.27     | 0.12         | 0.08            |               |
| Developed            | 5934.03   | 9.27         | 5.99            | 1.0           |
| Barren Land          | 1207.26   | 1.89         | 1.22            |               |
| Forest/Shrubland     | 77884.04  | 121.69       | 78.59           |               |
| Grassland/Herbaceous | 10803.79  | 16.88        | 10.90           |               |
| Pasture/Hay          | 3009.60   | 4.70         | 3.04            |               |
| Cultivated Crops     | 165.89    | 0.26         | 0.17            |               |
| Wetlands             | 14.68     | 0.02         | 0.01            |               |
| Total                | 99095.56  | 154.84       | 100.00          |               |

Table 8.80 Right Fork Beaver Creek RM 0.0 to 17.4 Water Withdrawals

| AI     | Right Fork Deaver Cit | Withdrawal    | Withdrawal | Facility | Facility  |
|--------|-----------------------|---------------|------------|----------|-----------|
| number | Source Description    | Facility Name | (cfs)      | Latitude | Longitude |
|        |                       | ICG Knott Co  |            |          |           |
|        | RM 40.6 Right Fork    | LLC (860-     |            |          |           |
| 2528   | Beaver Creek          | 8012)         | 0.4100156  | 37.32166 | -82.80366 |
|        |                       | Deane Mining  |            |          |           |
|        | RM 31.0 Right Fork    | LLC (860-     |            |          |           |
| 2525   | Beaver Creek          | 5318)         | 0.01547229 | 37.41038 | -82.78096 |
|        | RM 4.2 of Caney       | ICG Knott Co  |            |          |           |
| 3502   | Creek                 | LLC           | 1.005699   | 37.3884  | -82.82856 |
|        |                       | subtraction   |            |          |           |
|        |                       | from MAF      |            |          |           |
|        |                       | (sum of cfs)  | 1.43118689 |          |           |

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Table 8.81 Right Fork Beaver Creek RM 0.0 to 17.4 Data (Sites 30, 30a, 34, and 35)

|   |  |  | ita (Sites 30, 30a, 34   | ,   |
|---|--|--|--|---|
| Site 30   |  |  |  |   |
|   | E. coli  |  | Instantaneous  | Unit Area Load  |
|   | (colonies/100  |  | Load (billion <u>E</u> .   | (million <u>E</u> . <u>coli</u>   |
| Collection Date   | mls)   | Flow (cfs)   | coli colonies/day)   | colonies/day/acre)  |
| 05/16/07  | 310  | 70.79  | 536.90   | 5.45  |
| 05/30/07  | 310  | 29.77  | 225.79   | 2.29  |
| 5/30/07 (QA Sample)   | 490  | N/A  | N/A  | N/A   |
| 06/13/07  | 180  | 19.27  | 84.86  | 0.86  |
| 06/27/07  | 3700   | 63.551   | 5752.85  | 58.40   |
| 07/10/07  | 220  | 11.799   | 63.51  | 0.64  |
| 07/26/07  | 13000  | N/A  | N/A  |   |
| 08/17/07  | 210  | 7.202  | 37.00  | 0.38  |
| 8/17/07 (QA Sample)   | 140  | N/A  | N/A  | N/A   |
| 08/31/07  | 160  | N/A  | N/A  | N/A   |
| 09/14/07  | 180  | N/A  | N/A  | N/A   |
| 09/28/07  | 330  | N/A  | N/A  | N/A   |
| 10/12/07  | 40   | 25.701   | 25.15  | 0.26  |
| 11/16/07 (outside PCR   |  |  |  |   |
| season)   | 110  | 0.371  | 1.00   | 0.01  |
|   |  |  |  |   |
| Greatest Concentration  | 13000  |  |  |   |
| Greatest Concentration  | 13000  |  |  |   |
| Greatest Concentration  | 13000  |  |  |   |
| Greatest Concentration Site 30a   | 13000  |  |  |   |
|   | <u>E</u> . <u>coli</u>   |  | Instantaneous  | Unit Area Load  |
| Site 30a  |  |  | Load (billion <u>E</u> .   | (million <u>E</u> . <u>coli</u>   |
| Site 30a  Collection Date   | E. coli<br>(colonies/100<br>mls)   | Flow (cfs)   | Load (billion <u>E</u> . <u>coli</u> colonies/day)   | (million <u>E</u> . <u>coli</u> colonies/day/acre)  |
| Site 30a  Collection Date 05/16/08  | E. <u>coli</u><br>(colonies/100<br>mls)<br>560   | 65.85  | Load (billion <u>E</u> . coli colonies/day) 902.20   | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)<br>9.10   |
| Site 30a  Collection Date 05/16/08 05/30/08   | E. coli<br>(colonies/100<br>mls)<br>560<br>140   | 65.85<br>26.3  | Load (billion <u>E</u> .<br><u>coli</u> colonies/day)<br>902.20<br>90.08   | (million <u>E</u> . <u>coli</u><br>colonies/day/acre)<br>9.10<br>0.91   |
| Site 30a  Collection Date 05/16/08 05/30/08 06/13/08  | E. coli<br>(colonies/100<br>mls)<br>560<br>140<br>500  | 65.85<br>26.3<br>26.876  | Load (billion <u>E</u> . <u>coli</u> colonies/day)  902.20  90.08  328.77  | (million <u>E</u> . <u>coli</u> colonies/day/acre)  9.10  0.91  3.32  |
| Site 30a  Collection Date 05/16/08 05/30/08 06/13/08 06/27/08   | E. coli<br>(colonies/100<br>mls)<br>560<br>140<br>500<br>250   | 65.85<br>26.3<br>26.876<br>10.230  | Load (billion <u>E</u> . coli colonies/day)  902.20  90.08  328.77  62.57  | (million <u>E</u> . <u>coli</u> colonies/day/acre)  9.10  0.91  3.32  0.63  |
| Site 30a  Collection Date 05/16/08 05/30/08 06/13/08 06/27/08 07/11/08  | E. coli<br>(colonies/100<br>mls)<br>560<br>140<br>500<br>250<br>680  | 65.85<br>26.3<br>26.876<br>10.230<br>44.002  | Load (billion <u>E</u> . coli colonies/day)  902.20  90.08  328.77  62.57  732.05  | (million <u>E</u> . <u>coli</u> <u>colonies/day/acre</u> )  9.10  0.91  3.32  0.63  7.39                                    |
| Site 30a  Collection Date 05/16/08 05/30/08 06/13/08 06/27/08 07/11/08 07/31/08   | E. coli<br>(colonies/100<br>mls)<br>560<br>140<br>500<br>250<br>680<br>3800                                | 65.85<br>26.3<br>26.876<br>10.230<br>44.002<br>N/A   | Load (billion <u>E</u> .<br><u>coli</u> colonies/day)<br>902.20<br>90.08<br>328.77<br>62.57<br>732.05<br>N/A               | (million <u>E</u> . <u>coli</u> colonies/day/acre)  9.10  0.91  3.32  0.63  7.39  N/A                                       |
| Site 30a  Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08  08/08/08                               | E. coli<br>(colonies/100<br>mls)<br>560<br>140<br>500<br>250<br>680<br>3800<br>500                         | 65.85<br>26.3<br>26.876<br>10.230<br>44.002<br>N/A<br>22.4328                                      | Load (billion <u>E</u> .<br><u>coli</u> colonies/day)<br>902.20<br>90.08<br>328.77<br>62.57<br>732.05<br>N/A<br>274.42     | (million <u>E</u> . <u>coli</u> <u>colonies/day/acre</u> )  9.10  0.91  3.32  0.63  7.39  N/A  2.77                         |
| Site 30a  Collection Date 05/16/08 05/30/08 06/13/08 06/27/08 07/11/08 07/31/08 08/08/08                                      | E. coli<br>(colonies/100<br>mls)<br>560<br>140<br>500<br>250<br>680<br>3800<br>500<br>150                  | 65.85<br>26.3<br>26.876<br>10.230<br>44.002<br>N/A<br>22.4328<br>7.995                             | Load (billion <u>E</u> . coli colonies/day)  902.20  90.08  328.77  62.57  732.05  N/A  274.42  29.34                      | (million <u>E</u> . <u>coli</u> <u>colonies/day/acre</u> )  9.10  0.91  3.32  0.63  7.39  N/A  2.77  0.30                   |
| Site 30a  Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08  08/08/08  08/22/08  09/12/08           | E. coli<br>(colonies/100 mls)<br>560<br>140<br>500<br>250<br>680<br>3800<br>500<br>150<br>110              | 65.85<br>26.3<br>26.876<br>10.230<br>44.002<br>N/A<br>22.4328<br>7.995<br>11.121                   | Load (billion <u>E</u> . coli colonies/day)  902.20  90.08  328.77  62.57  732.05  N/A  274.42  29.34  29.93               | (million <u>E</u> . <u>coli</u> <u>colonies/day/acre</u> )  9.10  0.91  3.32  0.63  7.39  N/A  2.77  0.30  0.30             |
| Site 30a  Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08  08/08/08  08/22/08  09/12/08  09/20/08 | E. coli<br>(colonies/100 mls)<br>560<br>140<br>500<br>250<br>680<br>3800<br>500<br>150<br>110<br>120       | 65.85<br>26.3<br>26.876<br>10.230<br>44.002<br>N/A<br>22.4328<br>7.995<br>11.121<br>7.015          | Load (billion <u>E</u> . coli colonies/day)  902.20  90.08  328.77  62.57  732.05  N/A  274.42  29.34  29.93  20.60        | (million <u>E</u> . <u>coli</u> <u>colonies/day/acre</u> )  9.10  0.91  3.32  0.63  7.39  N/A  2.77  0.30  0.30  0.21       |
| Site 30a  Collection Date 05/16/08 05/30/08 06/13/08 06/27/08 07/11/08 07/31/08 08/08/08 08/22/08 09/12/08 09/20/08 10/17/08  | E. coli<br>(colonies/100 mls)<br>560<br>140<br>500<br>250<br>680<br>3800<br>500<br>150<br>110<br>120<br>50 | 65.85<br>26.3<br>26.876<br>10.230<br>44.002<br>N/A<br>22.4328<br>7.995<br>11.121<br>7.015<br>8.743 | Load (billion <u>E</u> . coli colonies/day)  902.20  90.08  328.77  62.57  732.05  N/A  274.42  29.34  29.93  20.60  10.70 | (million <u>E</u> . <u>coli</u> <u>colonies/day/acre</u> )  9.10  0.91  3.32  0.63  7.39  N/A  2.77  0.30  0.30  0.21  0.11 |
| Site 30a  Collection Date  05/16/08  05/30/08  06/13/08  06/27/08  07/11/08  07/31/08  08/08/08  08/22/08  09/12/08  09/20/08 | E. coli<br>(colonies/100 mls)<br>560<br>140<br>500<br>250<br>680<br>3800<br>500<br>150<br>110<br>120       | 65.85<br>26.3<br>26.876<br>10.230<br>44.002<br>N/A<br>22.4328<br>7.995<br>11.121<br>7.015          | Load (billion <u>E</u> . coli colonies/day)  902.20  90.08  328.77  62.57  732.05  N/A  274.42  29.34  29.93  20.60        | (million <u>E</u> . <u>coli</u> <u>colonies/day/acre</u> )  9.10  0.91  3.32  0.63  7.39  N/A  2.77  0.30  0.30  0.21       |

| Site 34  |  |   |   |   |
|--|--|---|---|---|
| Site 3 i   | E. coli  |   | Instantaneous   | Unit Area Load  |
|  | (colonies/100  |   | Load (billion <u>E</u> .                                    | (million <u>E</u> . <u>coli</u>                           |
| Collection Date  | mls)   | Flow (cfs)                                      | <u>coli</u> colonies/day)                                   | colonies/day/acre)  |
| 05/15/07   | 80   | 18.505  | 36.22   | 0.45  |
| 05/30/07   | 290  | 24.19   | 171.63  | 2.13  |
| 06/13/07   | 390  | 18.952  | 180.83  | 2.24  |
| 06/27/07   | 5900   | 21.113  | 3047.62   | 37.77   |
| 07/10/07   | 300  | 9.207   | 67.58   | 0.84  |
| 07/26/07   | 5100   | 69.501  | 8672.01   | 107.46  |
| 08/17/07   | 150  | 7.962   | 29.22   | 0.36  |
| 08/31/07   | 130  | N/A   | N/A   | N/A   |
| 09/14/07   | 210  | 3.97  | 20.40   | 0.25  |
| 09/28/07   | 100  | 1.933   | 4.73  | 0.06  |
| 10/12/07   | 120  | 3.6554  | 10.73   | 0.13  |
| 11/17/07 (outside PCR  |  |   |   |   |
| season)  | 3300   | 19.807  | 1599.16   | 19.82   |
| 11/17/07 (QA Sample)   | 2100   | N/A   | N/A   | N/A   |
| Greatest Concentration   | 5900   |   |   |   |
|  |  |   |   |   |
| Site 35  |  |   |   |   |
|  | E. coli  |   | Instantaneous   | Unit Area Load  |
|  | (colonies/100  |   | Load (billion <u>E</u> .                                    | (million <u>E</u> . <u>coli</u>                           |
| Collection Date  | mls)   | Flow (cfs)                                      | <u>coli</u> colonies/day)                                   | colonies/day/acre)  |
| 05/16/07   | 140  | N/A   | N/A   | N/A   |
| 05/30/07   | 190  | 27.832  | 129.38  | 1.43  |
| 06/13/07   |  |   |   | 1.15  |
|  | 340  | N/A   | N/A   | N/A   |
| 06/27/07   | 340<br>3500  | N/A<br>N/A                                      |   |   |
| 6/27/07 (QA Sample)  | 3500<br>2400   | N/A<br>N/A                                      | N/A<br>N/A<br>N/A   | N/A<br>N/A<br>N/A   |
|  | 3500   | N/A   | N/A<br>N/A  | N/A<br>N/A  |
| 6/27/07 (QA Sample)  | 3500<br>2400   | N/A<br>N/A                                      | N/A<br>N/A<br>N/A   | N/A<br>N/A<br>N/A   |
| 6/27/07 (QA Sample)<br>07/10/07  | 3500<br>2400<br>50   | N/A<br>N/A<br>N/A                               | N/A<br>N/A<br>N/A<br>N/A                                    | N/A<br>N/A<br>N/A<br>N/A                                  |
| 6/27/07 (QA Sample)<br>07/10/07<br>07/26/07<br>7/26/07 (QA Sample)<br>08/17/07                                     | 3500<br>2400<br>50<br>6700<br>1100<br>170                            | N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>6.893        | N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>28.67             | N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>0.32            |
| 6/27/07 (QA Sample)<br>07/10/07<br>07/26/07<br>7/26/07 (QA Sample)   | 3500<br>2400<br>50<br>6700<br>1100                                   | N/A<br>N/A<br>N/A<br>N/A<br>N/A                 | N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>N/A                      | N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>N/A                    |
| 6/27/07 (QA Sample)<br>07/10/07<br>07/26/07<br>7/26/07 (QA Sample)<br>08/17/07                                     | 3500<br>2400<br>50<br>6700<br>1100<br>170                            | N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>6.893        | N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>28.67             | N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>0.32            |
| 6/27/07 (QA Sample)<br>07/10/07<br>07/26/07<br>7/26/07 (QA Sample)<br>08/17/07<br>08/31/07                         | 3500<br>2400<br>50<br>6700<br>1100<br>170<br>70                      | N/A<br>N/A<br>N/A<br>N/A<br>N/A<br>6.893<br>N/A | N/A                     | N/A                   |
| 6/27/07 (QA Sample)<br>07/10/07<br>07/26/07<br>7/26/07 (QA Sample)<br>08/17/07<br>08/31/07<br>09/14/07             | 3500<br>2400<br>50<br>6700<br>1100<br>170<br>70<br>310               | N/A N/A N/A N/A N/A N/A 6.893 N/A N/A           | N/A                     | N/A                   |
| 6/27/07 (QA Sample)<br>07/10/07<br>07/26/07<br>7/26/07 (QA Sample)<br>08/17/07<br>08/31/07<br>09/14/07<br>09/28/07 | 3500<br>2400<br>50<br>6700<br>1100<br>170<br>70<br>310<br>640<br>310 | N/A N/A N/A N/A N/A 6.893 N/A N/A N/A 2.925     | N/A N/A N/A N/A N/A N/A N/A N/A N/A 28.67 N/A N/A N/A 22.18 | N/A N/A N/A N/A N/A N/A N/A N/A N/A 0.32 N/A N/A N/A 0.24 |
| 6/27/07 (QA Sample) 07/10/07 07/26/07 7/26/07 (QA Sample) 08/17/07 08/31/07 09/14/07 09/28/07 10/12/07             | 3500<br>2400<br>50<br>6700<br>1100<br>170<br>70<br>310<br>640        | N/A N/A N/A N/A N/A 6.893 N/A N/A N/A           | N/A N/A N/A N/A N/A N/A N/A N/A 28.67 N/A N/A N/A           | N/A N/A N/A N/A N/A N/A N/A N/A N/A 0.32 N/A N/A N/A      |

Table 8.82 TMDL for Right Fork Beaver Creek RM 0.0 to 17.4

|        |   | ight Fork Beaver C  | TEEK KIVI U.U | 10 17.4  |   |   |
|--------|---|---------------------|---------------|----------|---|---|
| TMDL   |   |                     |               |          | E. coli (billion                        |   |
| Table  |   |                     |               |          | colonies/day)                           |   |
|        |   |                     |               |          | <                                       | Existing                                |
|        |   |                     |               |          | 65184.6057                              | Load                                    |
|        |   |                     |               |          | 1000 1001                               | Total                                   |
|        |   |                     |               |          | 1203.4081                               | TMDL                                    |
|        |   |                     |               |          | 120.3408                                | MOS                                     |
|        |   |                     |               |          |   | TMDL                                    |
|        |   |                     |               |          | 1083.0673                               | Target                                  |
|        |   | 5.1 5.30            |               | Design   |   | 0.4                                     |
| AI     | *************************************** | Discharger Facility | _             | Capacity | 20.24                                   | %                                       |
| number | KPDES #                                 | Name                | Туре          | (cfs)    | 98.34                                   | reduction                               |
|        |   | KNOTT CO            | ~             |          |   |   |
|        |   | WATER &             | Sewerage      |          |   | KPDES                                   |
| 2527   | KY0042854                               | SEWER DIST          | System        | 0.154723 | 0.9085                                  | WLA                                     |
|        |   | WARCO               |               |          |   |   |
|        |   | HOUSING             | Apartment     |          |   | KPDES                                   |
| 1352   | KY0072974                               | PROJECT             | Building      | 0.038681 | 0.2271                                  | WLA                                     |
|        |   | ALLEN               |               |          |   |   |
|        |   | CENTRAL HIGH        |               |          |   | KPDES                                   |
| 35254  | KY0079430                               | SCHOOL              | School        | 0.01702  | 0.0999                                  | WLA                                     |
|        |   | GOLDEN YEARS        | Intermediate  |          |   | KPDES                                   |
| 2517   | KY0083089                               | REST HOME           | Care Facility | 0.015472 | 0.0908                                  | WLA                                     |
| 2317   | K10003007                               | JONES FORK          | Care r active | 0.015472 | 0.0700                                  | KPDES                                   |
| 35359  | KY0087076                               | ELEM SCHOOL         | School        | 0.009283 | 0.0545                                  | WLA                                     |
| 33337  | K10007070                               | JAMES A DUFF        | School        | 0.007203 | 0.0343                                  | KPDES                                   |
| 35258  | KY0093017                               | ELEM SCHOOL         | School        | 0.012378 | 0.0727                                  | WLA                                     |
| 20200  | 1210032017                              | EEEMTSCHOOL         | Bituminous    | 0.012070 | 0.0727                                  | *************************************** |
|        |   | CONSOL OF KY        | Coal & Lig,   |          |   | KPDES                                   |
| 2514   | KY0094510                               | INC JONES FORK      | Surface       | 0.004642 | 0.0273                                  | WLA                                     |
|        |   |                     | Sewerage      |          | *************************************** | KPDES                                   |
| 35761  | KY0105228                               | WAYLAND STP         | System        | 0.154723 | 0.9085                                  | WLA                                     |
|        |   | MAY VALLEY          |               |          | 717 700                                 | KPDES                                   |
| 82092  | KY0106755                               | ELEM SCHOOL         | School        | 0.009283 | 0.0545                                  | WLA                                     |
|        |   |                     | Sewerage      |          |   | KPDES                                   |
| 35260  | KY0107051                               | EASTERN STP         | System        | 0.038681 | 0.2271                                  | WLA                                     |
|        |   |                     | Dwelling      |          |   |   |
|        |   | GOBLE               | Other than    |          |   | KPDES                                   |
| 1196   | KYG400590                               | RESIDENCE           | Apartment     | 0.000774 | 0.0045                                  | WLA                                     |
|        |   |                     | Dwelling      |          |   |   |
|        |   | GREEN               | Other than    |          |   | KPDES                                   |
| 1199   | KYG400603                               | RESIDENCE           | Apartment     | 0.000774 | 0.0045                                  | WLA                                     |
|        |   |                     | Dwelling      |          |   |   |
|        |   | ALLEN               | Other than    |          |   | KPDES                                   |
| 1133   | KYG400642                               | RESIDENCE           | Apartment     | 0.000774 | 0.0045                                  | WLA                                     |
|        |   |                     | Dwelling      |          |   |   |
|        |   | MITCHELL            | Other than    |          |   | KPDES                                   |
| 1270   | KYG400666                               | RESIDENCE           | Apartment     | 0.000774 | 0.0045                                  | WLA                                     |
|        |   |                     | Dwelling      |          |   |   |
|        |   | HOOVER              | Other than    |          |   | KPDES                                   |
| 1222   | KYG400730                               | RESIDENCE           | Apartment     | 0.000774 | 0.0045                                  | WLA                                     |

| 4.7          |               | B: 1 B :::               |                         | Design         | F 1: 4:11:                     |              |
|--------------|---------------|--------------------------|-------------------------|----------------|--------------------------------|--------------|
| AI<br>number | KPDES#        | Discharger Facility Name | Туре                    | Capacity (cfs) | E. coli (billion colonies/day) |              |
| namoer       | IXI DES II    | Tume                     | Dwelling                | (015)          | coronness day)                 |              |
|              |               | TURNER                   | Other than              |                |                                | KPDES        |
| 1343         | KYG400778     | RESIDENCE                | Apartment               | 0.000774       | 0.0045                         | WLA          |
|              |               | DEDIZINIO                | Dwelling                |                |                                | LADDEC       |
| 1293         | KYG400836     | PERKINS<br>RESIDENCE     | Other than Apartment    | 0.000774       | 0.0045                         | KPDES<br>WLA |
| 1275         | K10400030     | RESIDENCE                | Dwelling                | 0.000774       | 0.0043                         | WLA          |
|              |               | SHEPHERD                 | Other than              |                |                                | KPDES        |
| 1314         | KYG400844     | RESIDENCE                | Apartment               | 0.000774       | 0.0045                         | WLA          |
|              |               |                          | Dwelling                |                |                                |              |
| 10.42        | 1/3/0/400017  | KESTER                   | Other than              | 0.000774       | 0.0045                         | KPDES        |
| 1243         | KYG400915     | RESIDENCE                | Apartment Dwelling      | 0.000774       | 0.0045                         | WLA          |
|              |               | MULLINS                  | Other than              |                |                                | KPDES        |
| 1276         | KYG400975     | RESIDENCE                | Apartment               | 0.000774       | 0.0045                         | WLA          |
|              |               |                          | Dwelling                |                |                                |              |
|              |               | MAY                      | Other than              |                |                                | KPDES        |
| 4327         | KYG401073     | RESIDENCE                | Apartment               | 0.000774       | 0.0045                         | WLA          |
|              |               | CACTIE                   | Dwelling                |                |                                | LADDEC       |
| 4350         | KYG401113     | CASTLE<br>RESIDENCE      | Other than<br>Apartment | 0.000774       | 0.0045                         | KPDES<br>WLA |
| 4330         | K10401113     | RESIDENCE                | Dwelling                | 0.000774       | 0.0043                         | WLA          |
|              |               | FRASURE                  | Other than              |                |                                | KPDES        |
| 4344         | KYG401121     | RESIDENCE                | Apartment               | 0.000774       | 0.0045                         | WLA          |
|              |               |                          | Dwelling                |                |                                |              |
| 1006         | *****         | CRUM                     | Other than              |                |                                | KPDES        |
| 4336         | KYG401125     | RESIDENCE                | Apartment               | 0.000774       | 0.0045                         | WLA          |
|              |               | SHEPPARD                 | Dwelling<br>Other than  |                |                                | KPDES        |
| 12253        | KYG401218     | RESIDENCE                | Apartment               | 0.000774       | 0.0045                         | WLA          |
|              |               |                          | Dwelling                |                | 300010                         |              |
|              |               | WEBB                     | Other than              |                |                                | KPDES        |
| 15655        | KYG401296     | RESIDENCE                | Apartment               | 0.000774       | 0.0045                         | WLA          |
|              |               | EVEDIDOE                 | Dwelling                |                |                                | LADDEC       |
| 15807        | KYG401352     | EVERIDGE<br>RESIDENCE    | Other than<br>Apartment | 0.000774       | 0.0045                         | KPDES<br>WLA |
| 13007        | K1 0401332    | RESIDENCE                | Dwelling                | 0.000774       | 0.0043                         | WLA          |
|              |               | WILLIAMSON               | Other than              |                |                                | KPDES        |
| 33378        | KYG401353     | RESIDENCE                | Apartment               | 0.000774       | 0.0045                         | WLA          |
|              |               |                          | Dwelling                |                |                                |              |
| 74107        | I/N/C/101/475 | HALL                     | Other than              | 0.000774       | 0.0045                         | KPDES        |
| 74185        | KYG401475     | RESIDENCE                | Apartment Dwelling      | 0.000774       | 0.0045                         | WLA          |
|              |               | WALLACE                  | Other than              |                |                                | KPDES        |
| 43120        | KYG401540     | RESIDENCE                | Apartment               | 0.000774       | 0.0045                         | WLA          |
|              |               |                          | Dwelling                |                |                                |              |
|              |               | PRATER                   | Other than              |                |                                | KPDES        |
| 43224        | KYG401548     | RESIDENCE                | Apartment               | 0.000774       | 0.0045                         | WLA          |
|              |               | CHII DEDC                | Dwelling<br>Other then  |                |                                | KDDEC        |
| 46147        | KYG401603     | CHILDERS<br>RESIDENCE    | Other than<br>Apartment | 0.000774       | 0.0045                         | KPDES<br>WLA |
| TU1+/        | K10401003     | KEDIDENCE                | Apartment               | 0.000774       | 0.0043                         | VV L/A       |

|        |  |                     |                        | Design   |                  |              |
|--------|--|---------------------|------------------------|----------|------------------|--------------|
| AI     |  | Discharger Facility |                        | Capacity | E. coli (billion |              |
| number | KPDES#                                 | Name                | Type                   | (cfs)    | colonies/day)    |              |
|        |  |                     | Dwelling               | ,        | · ·              |              |
|        |  | LAFERTY             | Other than             |          |                  | KPDES        |
| 47022  | KYG401638                              | RESIDENCE           | Apartment              | 0.000774 | 0.0045           | WLA          |
|        |  |                     | Dwelling               |          |                  |              |
|        |  | SCOTT               | Other than             |          |                  | KPDES        |
| 50627  | KYG401721                              | RESIDENCE           | Apartment              | 0.000774 | 0.0045           | WLA          |
|        |  |                     | Dwelling               |          |                  |              |
|        |  | KIDD                | Other than             |          |                  | KPDES        |
| 50950  | KYG401730                              | RESIDENCE           | Apartment              | 0.000774 | 0.0045           | WLA          |
|        |  | 70017               | Dwelling               |          |                  |              |
| 5.4050 | ************************************** | ISON                | Other than             | 0.000    | 2 22 4 7         | KPDES        |
| 54879  | KYG401772                              | RESIDENCE           | Apartment              | 0.000774 | 0.0045           | WLA          |
|        |  | HOWARD              | Dwelling               |          |                  | LADDEC       |
| 75556  | 1/3/0/101057                           | HOWARD              | Other than             | 0.000774 | 0.0045           | KPDES        |
| 75556  | KYG401857                              | RESIDENCE           | Apartment              | 0.000774 | 0.0045           | WLA          |
|        |  | BILITER             | Dwelling<br>Other than |          |                  | LADDEC       |
| 76078  | KYG401876                              | RESIDENCE           |                        | 0.000774 | 0.0045           | KPDES<br>WLA |
| 70078  | K104018/0                              | KESIDENCE           | Apartment Dwelling     | 0.000774 | 0.0045           | WLA          |
|        |  | SCARBERRY           | Other than             |          |                  | KPDES        |
| 81570  | KYG401981                              | RESIDENCE           | Apartment              | 0.000774 | 0.0045           | WLA          |
| 81370  | K1 0401901                             | RESIDENCE           | Dwelling               | 0.000774 | 0.0043           | WLA          |
|        |  | COOK                | Other than             |          |                  | KPDES        |
| 84292  | KYG402025                              | RESIDENCE           | Apartment              | 0.000774 | 0.0045           | WLA          |
| 01232  | 1010102025                             | RESIDENCE           | Dwelling               | 0.000771 | 0.0015           | VV 12/1      |
|        |  | PRATER              | Other than             |          |                  | KPDES        |
| 97291  | KYG402063                              | RESIDENCE           | Apartment              | 0.000774 | 0.0045           | WLA          |
|        |  |                     | Ţ                      |          |                  | Total        |
|        |  |                     |                        |          |                  | KPDES        |
|        |  |                     |                        |          | 2.8118           | WLA          |
|        |  |                     | Addition to            |          |                  |              |
|        |  |                     | MAF (sum of            |          |                  |              |
|        |  |                     | cfs)                   | 0.478867 | 1080.2555        | remainder    |
|        |  |                     |                        |          |                  | Future       |
|        |  |                     |                        |          |                  | Growth       |
|        |  |                     |                        |          | 10.8026          | WLA          |
|        |  |                     |                        |          |                  | Total        |
|        |  |                     |                        |          | 13.6144          | WLA          |
|        |  |                     |                        |          | 1069.4529        | LA           |

Note: (1) Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

### 8.20 Arkansas Creek RM 0.0 to 3.6

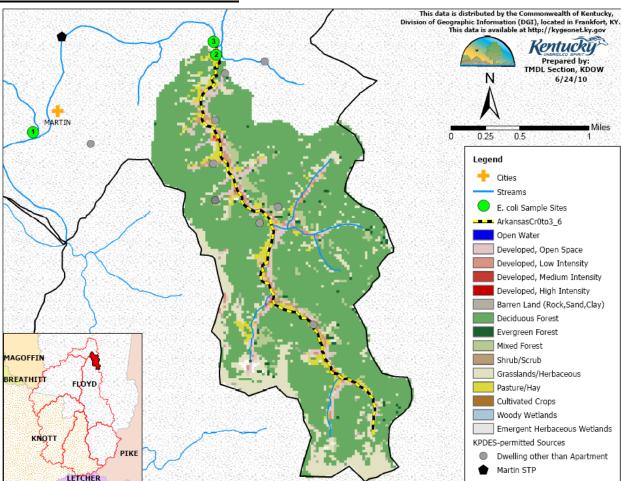


Figure 8.22 Arkansas Creek RM 0.0 to 3.6

Arkansas Creek is a third order stream located in the Mainstem Beaver Creek subwatershed in Floyd County (Figure 8.22). Information about Arkansas Creek, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.83. It has a catchment of 1,990 acres (3.1 square miles) with a 75% forested and 6.7% developed land cover (Table 8.84). This subwatershed is entirely un-sewered. There are no stream water withdrawals in this subwatershed. Sampling data from site 2 is presented in Table 8.85 and TMDL allocations in Table 8.86.

Table 8.83 Arkansas Creek RM 0.0 to 3.6 Information

| Stroom   | Stream   | WBID#     | County   | Aaraa     | Square | Stream Order  |         |         |          |
|----------|----------|-----------|----------|-----------|--------|---------------|---------|---------|----------|
| Stream   | Segment  | W DID #   | County   | Acres     | Miles  | Stream Order  |         |         |          |
|          | Arkansas |           |          |           |        |               |         |         |          |
|          | Creek    |           |          |           |        |               |         |         |          |
| Arkansas | 0.0 to   |           |          |           |        |               |         |         |          |
| Creek    | 3.6      | 486027_01 | Floyd    | 1990.21   | 3.11   | 3rd order     |         |         |          |
|          |          |           |          |           |        |               |         |         |          |
|          |          |           | Sample   | Sample    |        |               | + to    | - from  | Adjusted |
|          |          |           | _        | -         |        |               |         |         |          |
| EKU      | MAP      | Sample    | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF     | MAF      |
| Site #   | Site #   | Point RM  | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs)   | (cfs)    |
| 2        | 2        | 0.05      | 37.57810 | -82.73170 | 4.1    | 0             | 0.00542 | 0.00000 | 4.1054   |

Table 8.84 Arkansas Creek RM 0.0 to 3.6 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 0.00      | 0.00         | 0.00       |               |
| Developed            | 132.35    | 0.21         | 6.65       | 1.0           |
| Barren Land          | 8.69      | 0.01         | 0.44       |               |
| Forest/Shrubland     | 1497.78   | 2.34         | 75.26      |               |
| Grassland/Herbaceous | 267.38    | 0.42         | 13.43      |               |
| Pasture/Hay          | 82.44     | 0.13         | 4.14       |               |
| Cultivated Crops     | 1.34      | 0.00         | 0.07       |               |
| Wetlands             | 0.22      | 0.00         | 0.01       |               |
| Totals               | 1990.21   | 3.11         | 100.00     |               |

Table 8.85 Arkansas Creek RM 0.0 to 3.6 Data (Site 2)

| Tuote 0.05 / HRunsus electr | E. coli<br>(colonies/100 | Flow    | Instantaneous<br>Load (billion E. | Unit Area Load<br>(million E. coli |
|-----------------------------|--------------------------|---------|-----------------------------------|------------------------------------|
| Collection Date             | mls)                     | (cfs)   | coli colonies/day)                | colonies/day/acre)                 |
| 05/16/08                    | 580                      | 0.8     | 11.35                             | 5.70                               |
| 05/30/08                    | 70                       | 0.142   | 0.24                              | 0.12                               |
| 06/13/08                    | 140                      | 0.155   | 0.53                              | 0.27                               |
| 06/27/08                    | 50                       | 0.902   | 1.10                              | 0.55                               |
| 07/11/08                    | 680                      | 0.541   | 9.00                              | 4.52                               |
| 07/31/08                    | >80000                   | 1.541   | 3016.14                           | 1515.49                            |
| 08/08/08                    | 340                      | 25.5346 | 212.41                            | 106.73                             |
| 08/22/08                    | 130                      | 8.3208  | 26.46                             | 13.30                              |
| 09/12/08                    | 140                      | 0.0511  | 0.18                              | 0.09                               |
| 09/20/08                    | 290                      | 0.013   | 0.09                              | 0.05                               |
| 10/17/08                    | 2400                     | 0.14    | 8.22                              | 4.13                               |
| 10/24/08                    | 110                      | 0.03    | 0.08                              | 0.04                               |
| Greatest Concentration      | 80000                    |         |                                   |                                    |

Table 8.86 TMDL for Arkansas Creek RM 0.0 to 3.6

| Table 6.6 |           | Arkansas Creek | KIVI U.U 10 3.0 | 1        |                        |                    |
|-----------|-----------|----------------|-----------------|----------|------------------------|--------------------|
|           |           |                |                 |          | <u>E</u> . <u>coli</u> |                    |
| TMDL      |           |                |                 |          | (billion               |                    |
| Table     |           |                |                 |          | colonies/day)          |                    |
|           |           |                |                 |          |                        | Existing           |
|           |           |                |                 |          | 8035.3679              | Load               |
|           |           |                |                 |          |                        | Total              |
|           |           |                |                 |          | 24.1061                | TMDL               |
|           |           |                |                 |          | 2.4106                 | MOS                |
|           |           |                |                 |          |                        | TMDL               |
|           |           |                |                 |          | 21.6955                | Target             |
|           |           | Discharger     |                 | Design   |                        |                    |
| AI        |           | Facility       |                 | Capacity |                        | %                  |
| number    | KPDES#    | Name           | Type            | (cfs)    | 99.73                  | reduction          |
|           |           | ROWE           | Dwelling Other  |          |                        | KPDES              |
| 1304      | KYG400339 | RESIDENCE      | than Apartment  | 0.000774 | 0.0045                 | WLA                |
|           |           | LAWSON         | Dwelling Other  |          |                        | KPDES              |
| 1248      | KYG400593 | RESIDENCE      | than Apartment  | 0.000774 | 0.0045                 | WLA                |
|           |           | STURGILL       | Dwelling Other  |          |                        | KPDES              |
| 1328      | KYG400936 | RESIDENCE      | than Apartment  | 0.000774 | 0.0045                 | WLA                |
|           |           | ROSE           | Dwelling Other  |          |                        | KPDES              |
| 4342      | KYG401126 | RESIDENCE      | than Apartment  | 0.000774 | 0.0045                 | WLA                |
|           |           | COOLEY         | Dwelling Other  |          |                        | KPDES              |
| 4331      | KYG401143 | RESIDENCE      | than Apartment  | 0.000774 | 0.0045                 | WLA                |
|           |           | MCKINNEY       |                 |          |                        |                    |
|           |           | JR             | Dwelling Other  |          |                        | KPDES              |
| 53921     | KYG401764 | RESIDENCE      | than Apartment  | 0.000774 | 0.0045                 | WLA                |
|           |           | ALLEN          | Dwelling Other  |          |                        | KPDES              |
| 76185     | KYG401883 | RESIDENCE      | than Apartment  | 0.000774 | 0.0045                 | WLA                |
|           |           |                |                 |          |                        | Total              |
|           |           |                |                 |          |                        | KPDES              |
|           |           |                |                 |          | 0.0315                 | WLA                |
|           |           |                | Addition to     |          |                        |                    |
|           |           |                | MAF (sum of     |          |                        |                    |
|           |           |                | cfs)            | 0.005415 | 21.6637                | remainder          |
|           |           |                |                 |          |                        |                    |
|           |           |                |                 |          |                        | Future             |
|           |           |                |                 |          | 0.0166                 | Growth             |
|           |           |                |                 |          | 0.2166                 | WLA <sup>(1)</sup> |
|           |           |                |                 |          |                        |                    |
|           |           |                |                 |          |                        | Total              |
|           |           |                |                 |          | 0.2481                 | WLA                |
|           |           |                |                 |          |                        |                    |
|           |           |                |                 |          | 21.4471                | LA                 |

### Note:

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

#### 8.21 Buck Branch RM 0.0 to 2.8

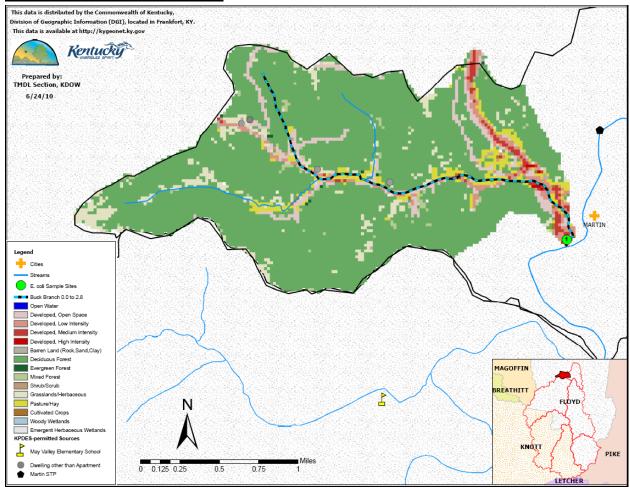


Figure 8.23 Buck Branch RM 0.0 to 2.8

Buck Branch is a second order stream located in the Mainstem Beaver Creek subwatershed in Floyd County (Figure 8.23). Information about Buck Branch, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.87. It has a catchment of 1,840 acres (2.9 square miles) with an 83% forested and 9.7% developed land cover (Table 8.88). This subwatershed is partially sewered near its mouth (see Figure 8.24). There are no stream water withdrawals in this subwatershed. Sampling data from site 1 is presented in Table 8.89 and TMDL allocations in Table 8.90.

Table 8.87 Buck Branch RM 0.0 to 2.8 Information

|        | 0 7 2 6 6 11 1    |           | 0.0 to =.0 | 21110111111111 |                 |               |         |         |          |
|--------|-------------------|-----------|------------|----------------|-----------------|---------------|---------|---------|----------|
| Stream | Stream<br>Segment | WBID#     | County     | Acres          | Square<br>Miles | Stream Order  |         |         |          |
| Stream | Buck              | WBIB #    | County     | 110105         | 111105          | Stream Graci  |         |         |          |
|        | Branch            |           |            |                |                 |               |         |         |          |
|        |                   |           |            |                |                 |               |         |         |          |
| Buck   | 0.0 to            |           |            |                |                 |               |         |         |          |
| Branch | 2.8               | 488192_01 | Floyd      | 1840.33        | 2.88            | 2nd order     |         |         |          |
|        |                   |           |            |                |                 |               |         |         |          |
|        |                   |           | Sample     | Sample         |                 |               | + to    | - from  | Adjusted |
| EKU    | MAP               | Sample    | Site       | Site           | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #            | Point RM  | Latitude   | Longitude      | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 1      | 1                 | 0.05      | 37.57060   | -82.75620      | 3.7             | 0             | 0.00309 | 0.00000 | 3.7031   |

Table 8.88 Buck Branch RM 0.0 to 2.8 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 0.00      | 0.00         | 0.00       |               |
| Developed            | 178.94    | 0.28         | 9.72       | 1.0           |
| Barren Land          | 5.91      | 0.01         | 0.32       |               |
| Forest/Shrubland     | 1534.74   | 2.40         | 83.39      |               |
| Grassland/Herbaceous | 118.88    | 0.19         | 6.46       |               |
| Pasture/Hay          | 80.59     | 0.13         | 4.38       |               |
| Cultivated Crops     | 3.78      | 0.01         | 0.21       |               |
| Wetlands             | 0.24      | 0.00         | 0.01       |               |
| Totals               | 1840.33   | 2.88         | 100.00     |               |

Table 8.89 Buck Branch RM 0.0 to 2.8 Data (Site 1)

| Tuble 6.69 Buck Brunen Re | E. coli<br>(colonies/100 | Flow   | Instantaneous Load (billion <u>E</u> . coli | Unit Area Load (million <u>E</u> . <u>coli</u> |
|---------------------------|--------------------------|--------|---|--|
| Collection Date           | mls)                     | (cfs)  | colonies/day)                               | colonies/day/acre)                             |
| 05/16/08                  | 1700                     | 1.132  | 47.08                                       | 25.58  |
| 05/30/08                  | 2500                     | 0.223  | 13.64                                       | 7.41   |
| 06/13/08                  | 1700                     | 0.298  | 12.39                                       | 6.73   |
| 06/27/08                  | 740                      | 0.117  | 2.12  | 1.15   |
| 6/27/2008 (QA sample)     | 460                      | N/A    | N/A   | N/A  |
| 07/11/08                  | 3000                     | 0.323  | 23.71                                       | 12.88  |
| 07/31/08                  | 64000                    | 1.003  | 1570.51                                     | 853.38   |
| 08/08/08                  | 2700                     | 0.3072 | 20.29                                       | 11.03  |
| 08/22/08                  | 170                      | 0.0885 | 0.37  | 0.20   |
| 09/12/08                  | 700                      | 0.078  | 1.34  | 0.73   |
| 09/20/08                  | 560                      | 0.056  | 0.77  | 0.42   |
| 10/17/08                  | 300                      | 0.117  | 0.86  | 0.47   |
| 10/24/08                  | 250                      | 0.114  | 0.70  | 0.38   |
| Greatest Concentration    | 64000                    |        |   |  |

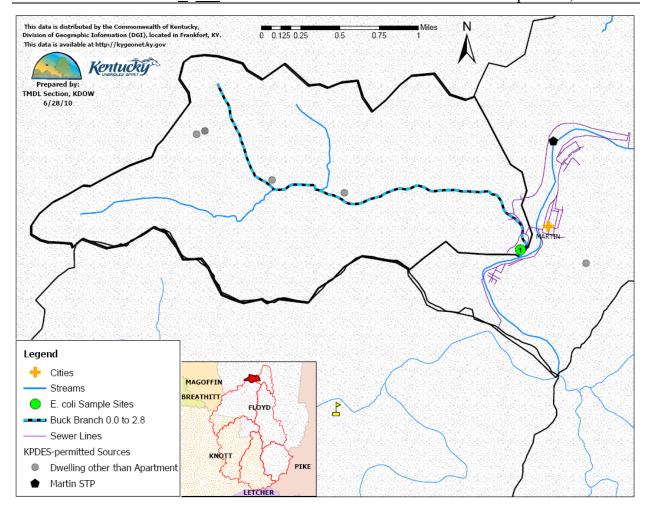


Figure 8.24 Buck Branch Sewer Lines

Table 8.90 TMDL for Buck Branch RM 0.0 to 2.8

| 1 aut 6.90 | TWIDL IOI DUC | K Branch Kivi U. | ) 10 2.8   |           |                        |                      |
|------------|---------------|------------------|------------|-----------|------------------------|----------------------|
|            |               |                  |            |           | <u>E</u> . <u>coli</u> |                      |
| TMDL       |               |                  |            |           | (billion               |                      |
| Table      |               |                  |            |           | colonies/day)          |                      |
| 1 4010     |               |                  |            |           | coronies, day)         | Existing             |
|            |               |                  |            |           | 5798.3369              | Load                 |
|            |               |                  |            |           | 3/90.3309              |                      |
|            |               |                  |            |           |                        | Total                |
|            |               |                  |            |           | 21.7438                | TMDL                 |
|            |               |                  |            |           | 2.1744                 | MOS                  |
|            |               |                  |            |           |                        | TMDL                 |
|            |               |                  |            |           | 19.5694                | Target               |
|            |               |                  |            | Design    |                        | <u> </u>             |
| AI         |               | Discharger       |            | Capacity  |                        | %                    |
| number     | KPDES#        | Facility Name    | Tyma       | (cfs)     | 99.66                  | reduction            |
| Hullibel   | KIDES#        | Tacility Name    | Type       | (CIS)     | 99.00                  | reduction            |
|            |               | 11.0000          | Dwelling   |           |                        |                      |
|            |               | JACOBS           | Other than |           |                        | KPDES                |
| 1232       | KYG400806     | RESIDENCE        | Apartment  | 0.0007736 | 0.0045                 | WLA                  |
|            |               |                  | Dwelling   |           |                        |                      |
|            |               | DEROSSETT        | Other than |           |                        | <b>KPDES</b>         |
| 1180       | KYG400520     | RESIDENCE        | Apartment  | 0.0007736 | 0.0045                 | WLA                  |
| 1100       | 1110:0020     | TESTS ET (CE     | Dwelling   | 0.0007720 | 0,000                  | ,,,                  |
|            |               | CARRAWAY         | Other than |           |                        | KPDES                |
| 1150       | WWC 400707    |                  |            | 0.0007726 | 0.0045                 |                      |
| 1158       | KYG400787     | RESIDENCE        | Apartment  | 0.0007736 | 0.0045                 | WLA                  |
|            |               |                  | Dwelling   |           |                        |                      |
|            |               | ROWE             | Other than |           |                        | KPDES                |
| 75746      | KYG401868     | RESIDENCE        | Apartment  | 0.0007736 | 0.0045                 | WLA                  |
|            |               |                  |            |           |                        | Total                |
|            |               |                  |            |           |                        | KPDES                |
|            |               |                  |            |           | 0.0180                 | WLA                  |
|            |               |                  | Addition   |           | 0.0100                 | , , 211              |
|            |               |                  | to MAF     |           |                        |                      |
|            |               |                  |            |           |                        |                      |
|            |               |                  | (sum of    | 0.0020045 | 10.5510                | . 1                  |
|            |               |                  | cfs)       | 0.0030945 | 19.5512                | remainder            |
|            |               |                  |            |           |                        | Future               |
|            |               |                  |            |           |                        | Growth               |
|            |               |                  |            |           | 0.1955                 | $\mathbf{WLA}^{(1)}$ |
|            |               |                  |            |           |                        | Total                |
|            |               |                  |            |           | 0.2135                 | WLA                  |
|            |               |                  |            |           | 19.3557                | LA                   |
|            | ]             |                  |            |           | 17.3337                | LA                   |

### Note:

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

### 8.22 Beaver Creek RM 0.0 to 7.1

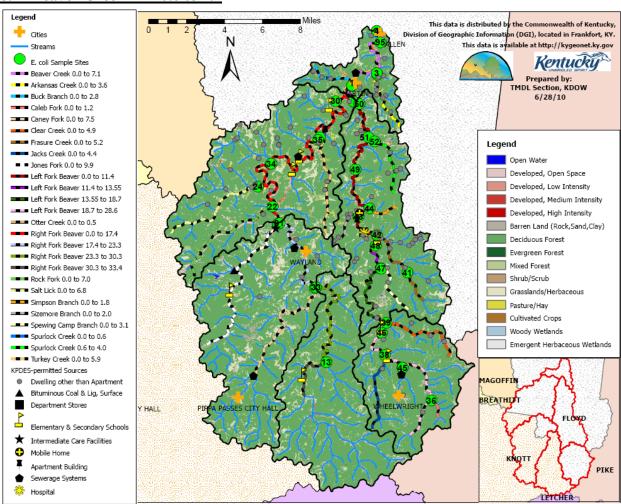


Figure 8.25 Beaver Creek RM 0.0 to 7.1

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 2 is under site 3, site 30a is to the immediate left of site 50, site 27 is under site 35, site 20 is under site 31, site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Beaver Creek at RM 0.0 is a fifth order stream located in Floyd County (Figure 8.25). Information about Beaver Creek RM 0.0 to 7.1, including sample site location, waterbody identification number (WBID), and MAF is shown in Table 8.91. It has a catchment of 153,670 acres (240.1 square miles) with an 80% forested and 6.5% developed land cover (Table 8.92). Portions of this watershed are sewered; especially in larger cities (see Figures 5.13 through 5.19). There are five stream water withdrawals in this subwatershed (Table 8.93). This segment had three sample sites and data from sites 3, 4, and PRI095 is presented in Table 8.94. Site PRI095 had the greatest concentration (19,000) so this concentration was used to set the existing loads and percent reduction for the impaired segment. However, to extrapolate to the end of the impaired segment, the Adjusted MAF from site 4 (316.8101 cfs) was used as the flow to set the TMDL for this impaired segment. The TMDL calculations for sites 3, 4, and PRI095 are shown in Appendix E while the TMDL for Beaver Creek RM 0.0 to 7.1 is shown in Table 8.95.

Table 8.91 Beaver Creek RM 0.0 to 7.1 Information

| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |         |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|---------|----------|
|        | Beaver            |           |          |           |                 |               |         |         |          |
|        | Creek             |           |          |           |                 |               |         |         |          |
| Beaver | 0.0 to            |           |          |           |                 |               |         |         |          |
| Creek  | 7.1               | 486610_01 | Floyd    | 153669.77 | 240.11          | 5th order     |         |         |          |
|        |                   |           |          |           |                 |               |         |         |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from  | Adjusted |
|        | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 3      | 3                 | 3.9       | 37.57950 | -82.73200 | 309.8           | 3.9           | 1.19400 | 2.19242 | 308.8016 |
| PRI095 | 95                | 1.1       | 37.60280 | -82.72754 | 317             | 1.1           | 1.20096 | 2.19242 | 316.0085 |
| 4      | 4                 | 0.2       | 37.61178 | -82.73071 | 317.8           | 0             | 1.20251 | 2.19242 | 316.8101 |

Table 8.92 Beaver Creek RM 0.0 to 7.1 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 89.41     | 0.14         | 0.06       |               |
| Developed            | 9935.56   | 15.52        | 6.47       | 1.0           |
| Barren Land          | 1724.06   | 2.69         | 1.12       |               |
| Forest/Shrubland     | 122227.36 | 190.98       | 79.54      |               |
| Grassland/Herbaceous | 14736.76  | 23.03        | 9.59       |               |
| Pasture/ Hay         | 4628.17   | 7.23         | 3.01       |               |
| Cultivated Crops     | 305.80    | 0.48         | 0.20       |               |
| Wetlands             | 22.68     | 0.04         | 0.01       |               |
| Totals               | 153669.77 | 240.11       | 100.00     |               |

Table 8.93 Beaver Creek RM 0.0 to 7.1 Water Withdrawals

| AI     |                     | Withdrawal    | Withdrawal | Facility | Facility  |
|--------|---------------------|---------------|------------|----------|-----------|
| number | Source Description  | Facility Name | (cfs)      | Latitude | Longitude |
|        |                     | ICG Knott Co  |            |          |           |
|        | RM 40.6 Right Fork  | LLC (860-     |            |          |           |
| 2528   | Beaver Creek        | 8012)         | 0.4100156  | 37.32166 | -82.80366 |
|        |                     | Deane Mining  |            |          |           |
|        | RM 31.0 Right Fork  | LLC (860-     |            |          |           |
| 2525   | Beaver Creek        | 5318)         | 0.01547229 | 37.41038 | -82.78096 |
|        | RM 15.36 of Left    | Elk Horn Coal |            |          |           |
| 1299   | Fork Beaver Creek   | Co LLC        | 0.09283372 | 37.40129 | -82.74175 |
|        | RM 4.2 of Caney     | ICG Knott Co  |            |          |           |
| 3502   | Creek               | LLC           | 1.005699   | 37.3884  | -82.82856 |
|        |                     | Black         |            |          |           |
|        | RM 2.4 of Left Fork | Diamond       |            |          |           |
| 78571  | Beaver Creek        | Mining        | 0.6684028  | 37.53192 | -82.74364 |
|        |                     | subtraction   |            |          |           |
|        |                     | from MAF      |            |          |           |
|        |                     | (sum of cfs)  | 2.19242341 |          |           |

Table 8.94 Beaver Creek RM 0.0 to 7.1 Data (Sites 3, 4, and PRI095)

| Site 3                 |                           |              | , ,                         |                            |
|------------------------|---------------------------|--------------|-----------------------------|----------------------------|
|                        | E. coli                   | Flow         | Instantaneous Load (billion | Unit Area Load (million    |
| Collection Date        | (colonies/100 mls)        | (cfs)        | E. coli colonies/day)       | E. coli colonies/day/acre) |
| 05/16/08               | 1100                      | N/A          | N/A                         | N/A                        |
| 05/30/08               | 130                       | 43.987       | 139.90                      | 0.94                       |
| 06/13/08               | 430                       | 45.528       | 478.97                      | 3.21                       |
| 06/27/08               | 180                       | 18.869       | 83.10                       | 0.56                       |
| 07/11/08               | 610                       | 60.4         | 901.42                      | 6.04                       |
| 7/11/08 (QA Sample)    | 550                       | N/A          | N/A                         | N/A                        |
| 07/31/08               | 4500                      | N/A          | N/A                         | N/A                        |
| 08/08/08               | 240                       | 0.0075       | 0.04                        | 0.00                       |
| 09/12/08               | 390                       | 23.475       | 223.99                      | 1.50                       |
| 09/20/08               | 90                        | 9.925        | 21.85                       | 0.15                       |
| 10/17/08               | 90                        | 9.692        | 21.34                       | 0.14                       |
| 10/24/08               | 750                       | 9.081        | 166.63                      | 1.12                       |
| Greatest concentration | 4500                      |              |                             |                            |
| G:4 4                  |                           |              |                             |                            |
| Site 4                 | E1:                       | E1           | Instanton cons I 1 (1.111)  | I In: 4 A mag I 1 ( !11:   |
| Callerties Date        | <u>E</u> . <u>coli</u>    | Flow         | Instantaneous Load (billion | Unit Area Load (million    |
| Collection Date        | (colonies/100 mls)<br>300 | (cfs)<br>N/A | E. coli colonies/day)       | E. coli colonies/day/acre) |
| 05/16/08               |                           |              | N/A                         | N/A                        |
| 05/30/08               | 290                       | 33.798       | 239.80                      | 1.56                       |
| 06/13/08               | 630                       | 34.654       | 534.14                      | 3.48                       |
| 06/27/08               | 180                       | 22.534       | 99.24                       | 0.65                       |
| 07/11/08               | 1500                      | 64.465       | 2365.78                     | 15.40                      |
| 07/31/08               | 1900                      | N/A          | N/A                         | N/A                        |
| 08/08/08               | 270<br>250                | 23.691       | 156.50                      | 1.02                       |
| 08/22/08               |                           | 6.8769       | 42.06                       | 0.27                       |
| 09/12/08               | 90                        | 18.639       | 41.04                       | 0.27                       |
| 09/20/08               | 380                       | 11.850       | 110.17                      | 0.72                       |
| 9/20/08 (QA Sample)    | 190                       | N/A          | N/A                         | N/A                        |
| 10/17/08               | 210                       | 8.251        | 42.39                       | 0.28                       |
| 10/24/08               | 70                        | 11.35        | 19.44                       | 0.13                       |
| 10/24/08 (QA Sample)   | 70                        | N/A          | N/A                         | N/A                        |
| Greatest concentration | 1900                      |              |                             |                            |
| Site PRI095            |                           |              |                             |                            |
| 5100 1 1110 9 0        | D 1                       | - F1         | T 1.0.111                   | TT '. A T 1/ 'H'           |
| 0.11 (1.15)            | <u>E</u> . <u>coli</u>    | Flow         | Instantaneous Load (billion | Unit Area Load (million    |
| Collection Date        | (colonies/100 mls)        | (cfs)        | E. coli colonies/day)       | E. coli colonies/day/acre) |
| 5/17/07                | 2700                      | N/A          | N/A                         | N/A                        |
| 6/14/07                | 656                       | N/A          | N/A                         | N/A                        |
| 7/19/07                | 426                       | N/A          | N/A                         | N/A                        |
| 8/14/07                | 500                       | N/A          | N/A                         | N/A                        |
| 9/20/07                | 268                       | N/A          | N/A                         | N/A                        |
| 10/18/07               | 261                       | N/A          | N/A                         | N/A                        |
| 5/21/08                | 450                       | N/A          | N/A                         | N/A                        |
| 6/17/08                | 19000                     | N/A          | N/A                         | N/A                        |
| 7/16/08                | 220                       | N/A          | N/A                         | N/A                        |
| 10/15/08               | 240                       | N/A          | N/A                         | N/A                        |
| Greatest concentration | 19000                     |              |                             |                            |

Table 8.95 TMDL for Beaver Creek RM 0.0 to 7.1

| Table         cold           147         18  | Oli (billion   Donies/day)   Existing   Load   Total   TMDL   MOS   TMDL   TM |
|--|--|
| 147  | Existing Load Total 360.2397 TMDL 86.0240 MOS  |
| 18   | 7268.9800 Load<br>Total<br>360.2397 TMDL<br>86.0240 MOS  |
| 18   | Total<br>360.2397 TMDL<br>86.0240 MOS  |
|  | 860.2397 TMDL<br>86.0240 MOS   |
|  | 86.0240 MOS  |
|  |  |
|  | I IMIDL.   |
| 16   | 574.2158 Target  |
| Discharger Facility Design   | 0/0  |
|  | 98.86 reduction  |
| Sewerage   | KPDES  |
|  | 1.0902 WLA   |
| WHEELWRIGHT Sewerage   | KPDES  |
|  | 2.0441 WLA   |
| KNOTT CO   | LIBBEG   |
| WATER & Sewerage   | KPDES  |
|  | 0.9085 WLA   |
| WARCO<br>HOUSING Apartment   | KPDES  |
|  | 0.2271 WLA   |
| BEAVER CREEK   | KPDES  |
|  | 0.0636 WLA   |
| MCDOWELL STREET  | KPDES  |
|  | 0.1363 WLA   |
| ALLEN  |  |
| CENTRAL HIGH   | KPDES  |
| 35254 KY0079430 SCHOOL School 0.017019519  | 0.0999 WLA   |
| GOLDEN YEARS   Intermediate  | KPDES  |
|  | 0.0908 WLA   |
| MCDOWELL   | LIBBER   |
| APPALACHIAN DECHOSE H  | KPDES  |
|  | 0.1817 WLA   |
| JONES FORK   | 0.0545 KPDES<br>WLA  |
| OSBORNE ELEM   0.009283374   0.00928374   0.0092874   0.0092874   0.0092874   0.0092874   0.0092874   0.0092874   0.0092874   0.0092874   0.0092874   0.0092874   0.0092874   0.0092874 | KPDES  |
|  | 0.0618 WLA   |
| JAMES A DUFF   | KPDES  |
|  | 0.0727 WLA   |
| SOUTH FLOYD  | KPDES  |
|  | 0.1363 WLA   |
| Bituminous   |  |
| CONSOL OF KY   Coal & Lig,   | KPDES  |
|  | 0.0273 WLA   |
| LEFT BEAVER  |  |
| CREEK Apartment  | KPDES  |
|  | 0.1635 WLA   |
| MCDOWELL DOLLAR  |  |
| DOLLAR GENERAL Department  | KPDES  |
|  | 0.0045 RPDES<br>WLA  |
| 1203   K10103130   STORE   Store   0.0007/3013   | KPDES  |
|  | 0.0899 WLA   |

| A.T. 1    | WDDEG //  | Discharger Facility       | T                      | Design         | E. coli (billion                        |              |
|-----------|-----------|---------------------------|------------------------|----------------|---|--------------|
| AI number | KPDES#    | Name                      | Type<br>Sewerage       | Capacity (cfs) | colonies/day)                           | KPDES        |
| 35761     | KY0105228 | WAYLAND STP               | System                 | 0.1547229      | 0.9085                                  | WLA          |
|           |           |                           | j                      |                |   |              |
| 82092     | KY0106755 | MAY VALLEY<br>ELEM SCHOOL | School                 | 0.009283375    | 0.0545                                  | KPDES        |
| 82092     | K10100/33 | ELEM SCHOOL               | Sewerage               | 0.009283373    | 0.0545                                  | WLA<br>KPDES |
| 35260     | KY0107051 | EASTERN STP               | System                 | 0.038680729    | 0.2271                                  | WLA          |
|           |           |                           | Dwelling               |                | *************************************** |              |
|           |           | ROWE                      | Other than             |                |   | KPDES        |
| 1304      | KYG400339 | RESIDENCE                 | Apartment              | 0.000773615    | 0.0045                                  | WLA          |
|           |           | MECHELI                   | Dwelling               |                |   | LIBBER       |
| 1260      | VVC400470 | MITCHELL                  | Other than             | 0.000772615    | 0.0045                                  | KPDES        |
| 1269      | KYG400478 | RESIDENCE                 | Apartment Dwelling     | 0.000773615    | 0.0045                                  | WLA          |
|           |           | BLACKBURN                 | Other than             |                |   | KPDES        |
| 1143      | KYG400479 | RESIDENCE                 | Apartment              | 0.000773615    | 0.0045                                  | WLA          |
|           |           |                           | Dwelling               |                |   |              |
|           |           | DEROSSETT                 | Other than             |                |   | KPDES        |
| 1180      | KYG400520 | RESIDENCE                 | Apartment              | 0.000773615    | 0.0045                                  | WLA          |
|           |           | HIGKG                     | Dwelling               |                |   | LADDEC       |
| 1218      | VVC400567 | HICKS<br>RESIDENCE        | Other than             | 0.000773615    | 0.0045                                  | KPDES        |
| 1218      | KYG400567 | RESIDENCE                 | Apartment Dwelling     | 0.000773013    | 0.0045                                  | WLA          |
|           |           | WRIGHT                    | Other than             |                |   | KPDES        |
| 1367      | KYG400579 | RESIDENCE                 | Apartment              | 0.000773615    | 0.0045                                  | WLA          |
|           |           |                           | Dwelling               |                |   |              |
|           |           | GOBLE                     | Other than             |                |   | KPDES        |
| 1196      | KYG400590 | RESIDENCE                 | Apartment              | 0.000773615    | 0.0045                                  | WLA          |
|           |           | LAWCON                    | Dwelling<br>Other than |                |   | LIDDEC       |
| 1248      | KYG400593 | LAWSON<br>RESIDENCE       | Apartment              | 0.000773615    | 0.0045                                  | KPDES<br>WLA |
| 1240      | K10400373 | RESIDENCE                 | Dwelling               | 0.000773013    | 0.0043                                  | WLA          |
|           |           | STUMBO                    | Other than             |                |   | KPDES        |
| 1327      | KYG400601 | RESIDENCE                 | Apartment              | 0.000773615    | 0.0045                                  | WLA          |
|           |           |                           | Dwelling               |                |   |              |
| 1100      | *****     | GREEN                     | Other than             | 0 00001-       |   | KPDES        |
| 1199      | KYG400603 | RESIDENCE                 | Apartment              | 0.000773615    | 0.0045                                  | WLA          |
|           |           | MCKINNEY                  | Dwelling<br>Other than |                |   | KPDES        |
| 1265      | KYG400612 | RESIDENCE                 | Apartment              | 0.000773615    | 0.0045                                  | WLA          |
| 1200      | 22.00012  |                           | Dwelling               | 21110773013    |   | .,           |
|           |           |                           | Other than             |                |   | KPDES        |
| 1182      | KYG400614 | DYE RESIDENCE             | Apartment              | 0.000773615    | 0.0045                                  | WLA          |
|           |           |                           | Dwelling               |                |   |              |
| 1122      | VVC400442 | ALLEN                     | Other than             | 0.000772615    | 0.0045                                  | KPDES        |
| 1133      | KYG400642 | RESIDENCE                 | Apartment Dwelling     | 0.000773615    | 0.0045                                  | WLA          |
|           |           | CURRENT                   | Other than             |                |   | KPDES        |
| 4250      | KYG400659 | RESIDENCE                 | Apartment              | 0.000773615    | 0.0045                                  | WLA          |
|           |           |                           | Dwelling               |                |   |              |
|           |           | MITCHELL                  | Other than             |                |   | KPDES        |
| 1270      | KYG400666 | RESIDENCE                 | Apartment              | 0.000773615    | 0.0045                                  | WLA          |

| AI number | KPDES#    | Discharger Facility<br>Name | Туре                                | Design<br>Capacity (cfs) | E. coli (billion colonies/day) |              |
|-----------|-----------|-----------------------------|-------------------------------------|--------------------------|--------------------------------|--------------|
| 1315      | KYG400677 | SHREWBERRY<br>RESIDENCE     | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1162      | KYG400678 | CASTLE<br>RESIDENCE         | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1161      | KYG400692 | CASE<br>RESIDENCE           | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1274      | KYG400714 | MULLINS<br>RESIDENCE        | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1369      | KYG400724 | YOUMANS<br>RESIDENCE        | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1222      | KYG400730 | HOOVER<br>RESIDENCE         | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1237      | KYG400753 | BINGHAM<br>RESIDENCE        | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1343      | KYG400778 | TURNER<br>RESIDENCE         | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1158      | KYG400787 | CARRAWAY<br>RESIDENCE       | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1173      | KYG400790 | COOK<br>RESIDENCE           | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1232      | KYG400806 | JACOBS<br>RESIDENCE         | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1293      | KYG400836 | PERKINS<br>RESIDENCE        | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1314      | KYG400844 | SHEPHERD<br>RESIDENCE       | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1168      | KYG400854 | COLLINS<br>RESIDENCE        | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1243      | KYG400915 | KESTER<br>RESIDENCE         | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1328      | KYG400936 | STURGILL<br>RESIDENCE       | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |
| 1202      | KYG400969 | HALL<br>RESIDENCE           | Dwelling<br>Other than<br>Apartment | 0.000773615              | 0.0045                         | KPDES<br>WLA |

|   |           |             | Discharger Facility   |                         | Design         | E. coli (billion |              |
|---|-----------|-------------|-----------------------|-------------------------|----------------|------------------|--------------|
| ļ | AI number | KPDES#      | Name                  | Туре                    | Capacity (cfs) | colonies/day)    |              |
|   |           |             | MEADE                 | Dwelling<br>Other than  |                |                  | KPDES        |
|   | 1266      | KYG400970   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
| İ |           |             |                       | Dwelling                |                | 000000           | ,,,          |
|   |           |             | MULLINS               | Other than              |                |                  | KPDES        |
| ļ | 1276      | KYG400975   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
|   |           |             | HOWELL                | Dwelling                |                |                  | LADDEC       |
|   | 4356      | KYG401040   | HOWELL<br>RESIDENCE   | Other than<br>Apartment | 0.000773615    | 0.0045           | KPDES<br>WLA |
| ļ | 4550      | K10401040   | RESIDENCE             | Dwelling                | 0.000773013    | 0.0043           | WLA          |
|   |           |             | MAY                   | Other than              |                |                  | KPDES        |
|   | 4327      | KYG401073   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
| Ì |           |             |                       | Dwelling                |                |                  |              |
|   |           |             | CASTLE                | Other than              |                |                  | KPDES        |
| ļ | 4350      | KYG401113   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
|   |           |             | FRASURE               | Dwelling<br>Other than  |                |                  | KPDES        |
|   | 4344      | KYG401121   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
| ļ | 7377      | K10401121   | RESIDENCE             | Dwelling                | 0.000773013    | 0.0043           | WLA          |
|   |           |             | CRUM                  | Other than              |                |                  | KPDES        |
| Į | 4336      | KYG401125   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
| ĺ |           |             |                       | Dwelling                |                |                  |              |
|   | 12.12     | WW.C.401106 | ROSE                  | Other than              | 0.000772615    | 0.004-           | KPDES        |
| ŀ | 4342      | KYG401126   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
|   |           |             | JONES                 | Dwelling<br>Other than  |                |                  | KPDES        |
|   | 4349      | KYG401133   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
| Ì | 15 15     | 11 0 101133 | RESIDENCE             | Dwelling                | 0.000773013    | 0.0012           | VV EAR       |
|   |           |             |                       | Other than              |                |                  | KPDES        |
| ļ | 4333      | KYG401140   | DYE RESIDENCE         | Apartment               | 0.000773615    | 0.0045           | WLA          |
|   |           |             |                       | Dwelling                |                |                  |              |
|   | 4222      | IZVC401140  | TACKETT               | Other than              | 0.000773615    | 0.0045           | KPDES        |
| ļ | 4332      | KYG401142   | RESIDENCE             | Apartment Dwelling      | 0.000773615    | 0.0045           | WLA          |
|   |           |             | COOLEY                | Other than              |                |                  | KPDES        |
|   | 4331      | KYG401143   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
| İ |           |             |                       | Dwelling                |                |                  |              |
|   |           |             | BARTLEY               | Other than              |                |                  | KPDES        |
| ļ | 4405      | KYG401197   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
|   |           |             | CHEDDADD              | Dwelling                |                |                  | LINDEG       |
|   | 12253     | KYG401218   | SHEPPARD<br>RESIDENCE | Other than<br>Apartment | 0.000773615    | 0.0045           | KPDES<br>WLA |
| ļ | 14433     | K10401210   | RESIDENCE             | Dwelling                | 0.000773013    | 0.0043           | VVLA         |
|   |           |             | LAWSON                | Other than              |                |                  | KPDES        |
|   | 15635     | KYG401271   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
| Ī |           |             |                       | Dwelling                |                |                  |              |
|   | 15655     | WWG 101201  | WEBB                  | Other than              | 0.000770515    | 0.004-           | KPDES        |
| ļ | 15655     | KYG401296   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
|   |           |             | EVERIDGE              | Dwelling<br>Other than  |                |                  | KPDES        |
|   | 15807     | KYG401352   | RESIDENCE             | Apartment               | 0.000773615    | 0.0045           | WLA          |
| L |           |             |                       | r                       |                | 0.00.0           |              |

| A I assemble on | KPDES#         | Discharger Facility | Т                      | Design         | E. coli (billion |   |
|-----------------|----------------|---------------------|------------------------|----------------|------------------|---|
| AI number       | KPDES#         | Name                | Туре                   | Capacity (cfs) | colonies/day)    |   |
|                 |                |                     | Dwelling               |                |                  |   |
| 22270           | 1737.0 4012.52 | WILLIAMSON          | Other than             | 0.000772615    | 0.0045           | KPDES   |
| 33378           | KYG401353      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
|                 |                | WILLIAMSON          | Dwelling<br>Other than |                |                  | LIDDEC  |
| 74022           | KYG401406      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | KPDES<br>WLA                                  |
| 74022           | K10401400      | RESIDENCE           | Dwelling               | 0.000773013    | 0.0043           | WLA   |
|                 |                | STUMBO              | Other than             |                |                  | KPDES   |
| 74025           | KYG401409      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
|                 |                |                     | Dwelling               |                | 00000            | .,,   |
|                 |                | MULLINS II          | Other than             |                |                  | KPDES   |
| 74062           | KYG401442      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
|                 |                |                     | Dwelling               |                |                  |   |
|                 |                | TACKETT             | Other than             |                |                  | KPDES   |
| 74181           | KYG401470      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
|                 |                |                     | Dwelling               |                |                  |   |
|                 |                | HALL                | Other than             |                |                  | KPDES   |
| 74185           | KYG401475      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
|                 |                | COLLDIC             | Dwelling               |                |                  | LADDEC  |
| 1160            | VVC401516      | COLLINS             | Other than             | 0.000772615    | 0.0045           | KPDES   |
| 1168            | KYG401516      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
|                 |                | KEATHLEY            | Dwelling<br>Other than |                |                  | KPDES   |
| 35892           | KYG401529      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
| 33692           | K10401329      | RESIDENCE           | Dwelling               | 0.000773013    | 0.0043           | WLA   |
|                 |                | MOORE               | Other than             |                |                  | KPDES   |
| 35887           | KYG401533      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
| 2000.           |                |                     | Dwelling               |                | 0,000            | , , <u>, , , , , , , , , , , , , , , , , </u> |
|                 |                | WALLACE             | Other than             |                |                  | KPDES   |
| 43120           | KYG401540      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
|                 |                |                     | Dwelling               |                |                  |   |
|                 |                | MCKINNEY            | Other than             |                |                  | KPDES   |
| 36057           | KYG401541      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
|                 |                | pp / mpp            | Dwelling               |                |                  |   |
| 42224           | 1/3/0/4015/40  | PRATER              | Other than             | 0.000772615    | 0.0045           | KPDES   |
| 43224           | KYG401548      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
|                 |                | CAUDILL             | Dwelling<br>Other than |                |                  | KPDES   |
| 44695           | KYG401580      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
| 44073           | K10401300      | KEDIDENCE           | Dwelling               | 0.000773013    | 0.0043           | VILA  |
|                 |                | DINGUS              | Other than             |                |                  | KPDES   |
| 45073           | KYG401582      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
| 150,5           |                |                     | Dwelling               |                |                  |   |
|                 |                | GEARHEART           | Other than             |                |                  | KPDES   |
| 45396           | KYG401587      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
|                 |                |                     | Dwelling               |                |                  |   |
|                 |                | HALL                | Other than             |                |                  | KPDES   |
| 45070           | KYG401590      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |
|                 |                |                     | Dwelling               |                |                  |   |
|                 |                | WILLIAMSON          | Other than             |                |                  | KPDES   |
| 46144           | KYG401601      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA   |

|           |              | Discharger Facility |                        | Design         | E. coli (billion |              |
|-----------|--------------|---------------------|------------------------|----------------|------------------|--------------|
| AI number | KPDES#       | Name                | Туре                   | Capacity (cfs) | colonies/day)    |              |
|           |              |                     | Dwelling               |                |                  |              |
|           |              | CHILDERS            | Other than             |                |                  | KPDES        |
| 46147     | KYG401603    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
|           |              |                     | Dwelling               |                |                  | _            |
| 4=000     | *****        | LAFERTY             | Other than             |                |                  | KPDES        |
| 47022     | KYG401638    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
|           |              | DITEE               | Dwelling               |                |                  | LADDEC       |
| 40074     | WWC401645    | DUFF                | Other than             | 0.000772615    | 0.0045           | KPDES        |
| 48864     | KYG401645    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
|           |              | COCHRAN             | Dwelling<br>Other than |                |                  | KPDES        |
| 48897     | KYG401646    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
| 40097     | K10401040    | RESIDENCE           | Dwelling               | 0.000773013    | 0.0043           | WLA          |
|           |              | YORK                | Other than             |                |                  | KPDES        |
| 49354     | KYG401654    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
| 19331     | 1210101051   | RESIDENCE           | Dwelling               | 0.000775015    | 0.0043           | VV E/IX      |
|           |              | BLANKENSHIP         | Other than             |                |                  | KPDES        |
| 50021     | KYG401692    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
| 00022     |              |                     | Dwelling               |                |                  |              |
|           |              | JUSTICE             | Other than             |                |                  | KPDES        |
| 50138     | KYG401699    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
|           |              |                     | Dwelling               |                |                  |              |
|           |              | SCOTT               | Other than             |                |                  | KPDES        |
| 50627     | KYG401721    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
|           |              |                     | Dwelling               |                |                  |              |
|           |              | KIDD                | Other than             |                |                  | KPDES        |
| 50950     | KYG401730    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
|           |              |                     | Dwelling               |                |                  |              |
|           |              | MCKINNEY JR         | Other than             |                |                  | KPDES        |
| 53921     | KYG401764    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
|           |              | IGONI               | Dwelling               |                |                  | LABBEC       |
| 5.4070    | 1/3/0/401770 | ISON                | Other than             | 0.000772615    | 0.0045           | KPDES        |
| 54879     | KYG401772    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
|           |              | NEWAAN              | Dwelling<br>Other than |                |                  | KDDEC        |
| 71436     | KYG401809    | NEWMAN<br>RESIDENCE | Apartment              | 0.000773615    | 0.0045           | KPDES<br>WLA |
| /1430     | K10401007    | KESIDENCE           | Dwelling               | 0.000773013    | 0.0043           | VLA          |
|           |              | COMBS               | Other than             |                |                  | KPDES        |
| 74243     | KYG401821    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
| , .2 .3   | 2210.01021   | TESTE ET (CE        | Dwelling               | 3.000,73013    | 0.0010           | .,           |
|           |              | LITTLE              | Other than             |                |                  | KPDES        |
| 75141     | KYG401851    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
|           |              |                     | Dwelling               |                |                  |              |
|           |              | HOWARD              | Other than             |                |                  | KPDES        |
| 75556     | KYG401857    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
|           |              |                     | Dwelling               |                |                  |              |
|           |              | ROWE                | Other than             |                |                  | KPDES        |
| 75746     | KYG401868    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |
|           |              |                     | Dwelling               |                |                  |              |
|           |              | BILITER             | Other than             |                |                  | KPDES        |
| 76078     | KYG401876    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA          |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

September, 2010

|           |              | Discharger Facility |                        | Design         | E. coli (billion |   |
|-----------|--------------|---------------------|------------------------|----------------|------------------|---|
| AI number | KPDES#       | Name                | Type                   | Capacity (cfs) | colonies/day)    |   |
|           |              |                     | Dwelling               |                |                  |   |
|           |              | ALLEN               | Other than             |                |                  | KPDES                                   |
| 76185     | KYG401883    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA                                     |
|           |              |                     | Dwelling               |                |                  |   |
|           | *****        | HARVEL              | Other than             | 0.000==0.61.5  |                  | KPDES                                   |
| 79525     | KYG401931    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA                                     |
|           |              | DENTE EN            | Dwelling               |                |                  | LIBBER                                  |
| 70042     | 17370 401027 | BENTLEY             | Other than             | 0.000772615    | 0.0045           | KPDES                                   |
| 79842     | KYG401936    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA                                     |
|           |              | MADTIN              | Dwelling               |                |                  | LIDDEC                                  |
| 01102     | VVC401070    | MARTIN              | Other than             | 0.000772615    | 0.0045           | KPDES                                   |
| 81193     | KYG401970    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA                                     |
|           |              | SCARBERRY           | Dwelling<br>Other than |                |                  | KPDES                                   |
| 81570     | KYG401981    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA                                     |
| 81370     | K 1 0401981  | KESIDENCE           | Dwelling               | 0.000773013    | 0.0045           | WLA                                     |
|           |              | HOPKINS             | Other than             |                |                  | KPDES                                   |
| 82471     | KYG402002    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA                                     |
| 024/1     | K10402002    | RESIDENCE           | Dwelling               | 0.000773013    | 0.0043           | WLA                                     |
|           |              | COOK                | Other than             |                |                  | KPDES                                   |
| 84292     | KYG402025    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA                                     |
| 04272     | K1 0402023   | RESIDENCE           | Dwelling               | 0.000773013    | 0.0043           | WLA                                     |
|           |              | PRATER              | Other than             |                |                  | KPDES                                   |
| 97291     | KYG402063    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA                                     |
| 7/271     | R1 G 102005  | RESIDENCE           | Dwelling               | 0.000775015    | 0.0043           | *************************************** |
|           |              | LITTLE              | Other than             |                |                  | KPDES                                   |
| 103052    | KYG402117    | RESIDENCE           | Apartment              | 0.000773615    | 0.0045           | WLA                                     |
|           |              |                     |                        |                | 0,000,10         | Total                                   |
|           |              |                     |                        |                |                  | KPDES                                   |
|           |              |                     |                        |                | 7.0609           | WLA                                     |
|           |              |                     | Addition to            |                |                  |   |
|           |              |                     | MAF (sum               |                |                  |   |
|           |              |                     | of cfs)                | 1.202506386    | 1667.1549        | remainder                               |
|           |              |                     |                        |                |                  | Future                                  |
|           |              |                     |                        |                |                  | Growth                                  |
|           |              |                     |                        |                | 16.6715          | $\mathbf{WLA}^{(1)}$                    |
|           |              |                     |                        |                |                  | Total                                   |
|           |              |                     |                        |                | 23.7324          | WLA                                     |
|           |              |                     |                        |                | 1650.4834        | LA                                      |

#### Note

<sup>(1)</sup> Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.

## **8.23 TMDL Summary**

A TMDL summary matrix is presented in Table 8.96. The total KPDES-permitted WLA and the Total WLA (KPDES-permitted WLA + Future Growth WLA) are included at the bottom of this table. All loads are expressed in units of billion <u>E</u>. <u>coli</u> colonies per day while percent reduction is expressed as a percentage.

Table 8.96 TMDL Summary Matrix

| Table 8.   | 96 TMDL S                               | Summary              | Matrix           |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  |                                 |  |                  |                  |                                  |                       |                    |             |                      |                             |                        |
|--|---|----------------------|------------------|--------------------------|-------------------|-------------------|---------------------------------|---------------------|--------------------------------|----------------------|---------------------------------|--|--|---------------------------------|--|------------------|------------------|----------------------------------|-----------------------|--------------------|-------------|----------------------|-----------------------------|------------------------|
| Loads are in units of billion <u>E</u> . <u>coli</u> <u>colonies</u> / | Percent<br>Reduction is<br>expressed as |                      | Caleb<br>Fork RM | Clear Creek<br>RM 0.0 to | Jacks<br>Creek RM | Otter<br>Creek RM | Left Fork<br>Beaver<br>Creek RM | Frasure<br>Creek RM | Simpson<br>Branch<br>RM 0.0 to | Spurlock<br>Creek RM | Sizemore<br>Branch<br>RM 0.0 to | Spewing<br>Camp<br>Branch<br>RM 0.0 to | Left Fork<br>Beaver<br>Creek RM<br>11.4 to | Left Fork<br>Beaver<br>Creek RM | Right<br>Fork<br>Beaver<br>Creek RM<br>30.3 to | Caney<br>Fork RM | Jones<br>Fork RM | Right Fork<br>Beaver<br>Creek RM | Salt Lick<br>Creek RM | Turkey<br>Creek RM |             | Arkansas<br>Creek RM | Buck<br>Branch<br>RM 0.0 to | Beaver<br>Creek 0.0 to |
| day  | a percentage                            | Existing             | 0.0 to 1.2       | 4.9                      | 0.0 to 4.4        | 0.0 to 0.5        | 18.7 to 28.6                    | 0.0 to 5.2          | 1.8                            | 0.0 to 0.6           | 2.0                             | 3.1                                    | 13.55                                      | 0.0 to 11.4                     | 33.4   | 0.0 to 7.5       | 0.0 to 9.9       | 17.4 to 23.3                     | 0.0 to 6.8            | 0.0 to 5.9         | 0.0 to 17.4 | 0.0 to 3.6           | 2.8                         | 7.1                    |
|  |   | Load<br>Total        | 5284.6038        | 13901.0933               | 1783.7241         | 9686.2876         | 69257.5721                      | 27154.7145          | 3436.0145                      | 6117.7027            | 3704.6737                       | 4327.5145                              | 90650.1145                                 | 126755.5507                     | 1994.2419                                      | 549.4722         | 3243.4191        | 10391.2139                       | 27133.8788            | 10107.7083         | 65184.6057  | 8035.3679            | 5798.3369                   | 147268.9800            |
|  |   | TMDL                 | 15.8538          | 41.7033                  | 47.5660           | 29.0589           | 207.7727                        | 91.7906             | 15.2712                        | 29.9643              | 12.3489                         | 19.9731                                | 315.3047                                   | 573.9874                        |  | 191.1208         | 181.0280         | 608.2662                         | 98.6687               | 41.1161            | 1203.4081   | 24.1061              | 21.7438                     | 1860.2397              |
|  |   | MOS<br>TMDL          | 1.5854           | 4.1703                   | 4.7566            | 2.9059            | 20.7773                         | 9.1791              | 1.5271                         | 2.9964               | 1.2349                          | 1.9973                                 | 31.5305                                    | 57.3987                         | 25.1904  | 19.1121          | 18.1028          | 60.8266                          | 9.8669                | 4.1116             | 120.3408    | 2.4106               | 2.1744                      | 186.0240               |
|  |   | Target               | 14.2684          | 37.5330                  | 42.8094           | 26.1530           | 186.9954                        | 82.6115             | 13.7441                        | 26.9678              | 11.1140                         | 17.9758                                | 283.7743                                   | 516.5887                        | 226.7138                                       | 172.0087         | 162.9252         | 547.4396                         | 88.8018               | 37.0045            | 1083.0673   | 21.6955              | 19.5694                     | 1674.2158              |
| AI#  | KPDES#                                  | percent<br>reduction | 99.73            | 99.73                    | 97.60             | 99.73             | 99.73                           | 99.70               | 99.60                          | 99.56                | 99.70                           | 99.58                                  | 99.69                                      | 99.59                           | 88.63  | 68.70            | 94.98            | 94.73                            | 99.67                 | 99.63              | 98.34       | 99.73                | 99.66                       | 98.86                  |
| 1133   | KYG400642                               | KPDES<br>WLA         |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  |                                 |  |                  |                  |                                  |                       |                    | 0.0045      |                      |                             | 0.0045                 |
| 1134   | KY0085791                               | KPDES<br>WLA         |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  | 0.1817                          |  |                  |                  |                                  |                       |                    |             |                      |                             | 0.1817                 |
| 1143   | KYG400479                               | KPDES<br>WLA         |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  | 0.0045                          |  |                  |                  |                                  |                       |                    |             |                      |                             | 0.0045                 |
|  | KYG400787                               | KPDES<br>WLA         |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  |                                 |  |                  |                  |                                  |                       |                    |             |                      | 0.0045                      | 0.0045                 |
|  | KYG400692                               | KPDES<br>WLA         |                  |                          |                   |                   |                                 |                     |                                | 0.0045               |                                 |  |  | 0.0045                          |  |                  |                  |                                  |                       |                    |             |                      | 0.0010                      | 0.0045                 |
|  | KYG400678                               | KPDES<br>WLA         |                  |                          |                   |                   |                                 |                     |                                | 0.0045               |                                 |  |  | 0.0045                          |  |                  |                  |                                  |                       |                    |             |                      |                             | 0.0045                 |
|  |   | KPDES                |                  |                          |                   |                   |                                 |                     |                                | 0.0043               | 0.0045                          |  |  |                                 |  |                  |                  |                                  |                       |                    |             |                      |                             |                        |
|  |   | WLA<br>KPDES         |                  |                          |                   |                   |                                 |                     |                                |                      | 0.0045                          |  |  | 0.0045                          |  |                  |                  |                                  |                       |                    |             |                      |                             | 0.0045                 |
| 1168   | KYG401516                               | WLA<br>KPDES         |                  |                          |                   |                   |                                 |                     |                                |                      | 0.0045                          |  |  | 0.0045                          |  |                  |                  |                                  |                       |                    |             |                      |                             | 0.0045                 |
| 1173   | KYG400790                               | WLA<br>KPDES         |                  | 0.0045                   |                   |                   |                                 |                     |                                |                      |                                 |  | 0.0045                                     | 0.0045                          |  |                  |                  |                                  |                       |                    |             |                      |                             | 0.0045                 |
| 1180   | KYG400520                               | WLA<br>KPDES         |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  |                                 |  |                  |                  |                                  |                       |                    |             |                      | 0.0045                      | 0.0045                 |
| 1182   | KYG400614                               | WLA<br>KPDES         |                  |                          |                   |                   |                                 | 0.0045              |                                |                      |                                 |  |  | 0.0045                          |  |                  |                  |                                  |                       |                    |             |                      |                             | 0.0045                 |
| 1196   | KYG400590                               | WLA                  |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  |                                 |  |                  |                  |                                  |                       |                    | 0.0045      |                      |                             | 0.0045                 |
| 1199   | KYG400603                               | KPDES<br>WLA         |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  |                                 |  |                  |                  |                                  | 0.0045                |                    | 0.0045      |                      |                             | 0.0045                 |
| 1202   | KYG400969                               | KPDES<br>WLA         |                  |                          |                   |                   |                                 | 0.0045              |                                |                      |                                 |  |  | 0.0045                          |  |                  |                  |                                  |                       |                    |             |                      |                             | 0.0045                 |
|  | KYG400567                               | KPDES<br>WLA         |                  |                          |                   |                   |                                 |                     |                                |                      | 0.0045                          |  |  | 0.0045                          |  |                  |                  |                                  |                       |                    |             |                      |                             | 0.0045                 |
|  | KYG400730                               | KPDES                |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  |                                 |  |                  |                  |                                  |                       |                    | 0.0045      |                      |                             | 0.0045                 |
|  | KYG400806                               | KPDES                |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  |                                 |  |                  |                  |                                  |                       |                    | 0.0010      |                      | 0.0045                      | 0.0045                 |
|  | KYG400753                               | KPDES                |                  | 0.0045                   |                   |                   |                                 |                     |                                |                      |                                 |  | 0.0045                                     | 0.0045                          |  |                  |                  |                                  |                       |                    |             |                      | 0.0043                      | 0.0045                 |
|  |   | KPDES                |                  | 0.0045                   |                   |                   |                                 |                     |                                |                      |                                 |  | 0.0045                                     | 0.0045                          |  |                  |                  | 0.0047                           |                       |                    | 0.0017      |                      |                             |                        |
|  | KYG400915                               | KPDES                |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  |                                 |  |                  |                  | 0.0045                           |                       |                    | 0.0045      |                      |                             | 0.0045                 |
|  | KYG400593                               | KPDES                |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  |                                 |  |                  |                  |                                  |                       |                    |             | 0.0045               |                             | 0.0045                 |
|  |   | WLA<br>KPDES         |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  | 0.1635                          |  |                  |                  |                                  |                       |                    |             |                      |                             | 0.1635                 |
| 1262   | KY0026921                               | WLA<br>KPDES         |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  |                                 |  |                  |                  |                                  |                       |                    |             |                      |                             | 1.0902                 |
| 1263   | KY0103136                               |                      |                  |                          |                   |                   |                                 |                     |                                |                      |                                 |  |  | 0.0045                          |  |                  |                  |                                  |                       |                    |             |                      |                             | 0.0045                 |

| Loads are in units of             |                         |              |            |             |            |            |                     |            |                   |            |                    | Spewing        | Left Fork          |                     | Right<br>Fork      |            |            |                      |            |            |                      |            |                |              |
|-----------------------------------|-------------------------|--------------|------------|-------------|------------|------------|---------------------|------------|-------------------|------------|--------------------|----------------|--------------------|---------------------|--------------------|------------|------------|----------------------|------------|------------|----------------------|------------|----------------|--------------|
| billion <u>E</u> .<br><u>coli</u> | Percent<br>Reduction is |              | Caleb      | Clear Creek | Jacks      | Otter      | Left Fork<br>Beaver | Frasure    | Simpson<br>Branch | Spurlock   | Sizemore<br>Branch | Camp<br>Branch | Beaver<br>Creek RM | Left Fork<br>Beaver | Beaver<br>Creek RM | Caney      | Jones      | Right Fork<br>Beaver | Salt Lick  | Turkey     | Right Fork<br>Beaver | Arkansas   | Buck<br>Branch | Beaver       |
| colonies/                         | expressed as            |              | Fork RM    | RM 0.0 to   | Creek RM   | Creek RM   | Creek RM            | Creek RM   | RM 0.0 to         | Creek RM   | RM 0.0 to          | RM 0.0 to      | 11.4 to            | Creek RM            | 30.3 to            | Fork RM    | Fork RM    | Creek RM             | Creek RM   | Creek RM   | Creek RM             | Creek RM   | RM 0.0 to      | Creek 0.0 to |
| day                               | a percentage            | KPDES        | 0.0 to 1.2 | 4.9         | 0.0 to 4.4 | 0.0 to 0.5 | 18.7 to 28.6        | 0.0 to 5.2 | 1.8               | 0.0 to 0.6 | 2.0                | 3.1            | 13.55              | 0.0 to 11.4         | 33.4               | 0.0 to 7.5 | 0.0 to 9.9 | 17.4 to 23.3         | 0.0 to 6.8 | 0.0 to 5.9 | 0.0 to 17.4          | 0.0 to 3.6 | 2.8            | 7.1          |
|                                   |                         | WLA<br>KPDES |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
| 1266                              | KYG400970               | WLA<br>KPDES |            | 0.0045      |            |            |                     |            |                   |            |                    |                | 0.0045             | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
| 1269                              | KYG400478               | WLA<br>KPDES |            |             |            |            |                     | 0.0045     |                   |            |                    |                |                    | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
| 1270                              | KYG400666               | WLA          |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      |            |            | 0.0045               |            |                | 0.0045       |
| 1274                              | KYG400714               | KPDES<br>WLA |            |             |            |            |                     |            |                   |            |                    |                | 0.0045             | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
| 1276                              | KYG400975               | KPDES<br>WLA |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      |            | 0.0045     | 0.0045               |            |                | 0.0045       |
| 1293                              | KYG400836               | KPDES<br>WLA |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            | 0.0045               |            |            | 0.0045               |            |                | 0.0045       |
|                                   |                         | KPDES<br>WLA |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      |            |            |                      | 0.0045     |                | 0.0045       |
|                                   | KY0103233               | KPDES<br>WLA |            |             |            |            |                     |            |                   |            |                    |                |                    | 0.0899              |                    |            |            |                      |            |            |                      | 0.0043     |                | 0.0899       |
|                                   |                         | KPDES        |            |             |            |            |                     |            |                   |            |                    |                |                    | 0.0022              |                    |            |            |                      | 0.0045     |            | 2 22 45              |            |                |              |
|                                   |                         | WLA<br>KPDES |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      | 0.0045     |            | 0.0045               |            |                | 0.0045       |
|                                   | KYG400677               | WLA<br>KPDES |            |             |            |            |                     |            |                   | 0.0045     |                    |                |                    | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
| 1327                              | KYG400601               | WLA<br>KPDES |            |             |            |            |                     | 0.0045     |                   |            |                    |                |                    | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
| 1328                              | KYG400936               | WLA<br>KPDES |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      |            |            |                      | 0.0045     |                | 0.0045       |
| 1343                              | KYG400778               | WLA<br>KPDES |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      |            |            | 0.0045               |            |                | 0.0045       |
| 1352                              | KY0072974               | WLA          |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      |            |            | 0.2271               |            |                | 0.2271       |
| 1367                              | KYG400579               | KPDES<br>WLA |            |             |            |            |                     |            |                   |            |                    |                |                    | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
| 1369                              | KYG400724               | KPDES<br>WLA |            |             |            |            |                     |            |                   |            | 0.0045             |                |                    | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
| 2514                              | KY0094510               | KPDES<br>WLA |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            | 0.0273     |                      |            |            | 0.0273               |            |                | 0.0273       |
| 2517                              | KY0083089               | KPDES<br>WLA |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            | 0.0908     |                      |            |            | 0.0908               |            |                | 0.0908       |
|                                   | KY0042854               | KPDES<br>WLA |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    | 0.9085     |            | 0.9085               |            |            | 0.9085               |            |                | 0.9085       |
|                                   | KYG400659               | KPDES        |            |             |            |            |                     |            |                   |            |                    |                |                    | 0.0045              |                    | 0.2003     |            | 0.7003               |            |            | 0.7003               |            |                | 0.0045       |
|                                   |                         | KPDES        |            |             |            |            |                     |            |                   |            |                    |                |                    | 0.0045              |                    |            |            |                      |            |            |                      |            |                |              |
|                                   | KYG401073               | KPDES        |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      |            |            | 0.0045               |            |                | 0.0045       |
|                                   | KYG401143               | KPDES        |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      |            |            |                      | 0.0045     |                | 0.0045       |
| 4332                              | KYG401142               | WLA<br>KPDES |            |             |            |            |                     |            |                   |            |                    |                |                    | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
| 4333                              | KYG401140               |              |            |             |            |            |                     |            |                   |            |                    |                | 0.0045             | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
| 4336                              | KYG401125               | WLA<br>KPDES |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            | 0.0045               |            |            | 0.0045               |            |                | 0.0045       |
| 4342                              | KYG401126               | WLA          |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      |            |            |                      | 0.0045     |                | 0.0045       |
| 4344                              | KYG401121               | KPDES<br>WLA |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      |            | 0.0045     | 0.0045               |            |                | 0.0045       |
| 4349                              | KYG401133               | KPDES<br>WLA |            |             | 0.0045     |            | 0.0045              |            |                   |            |                    |                | 0.0045             | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
|                                   | KYG401113               | KPDES        |            |             |            |            |                     |            |                   |            |                    |                |                    |                     |                    |            |            |                      | 0.0045     |            | 0.0045               |            |                | 0.0045       |
|                                   | KYG401040               | KPDES        |            |             |            |            |                     | 0.0045     |                   |            |                    |                |                    | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |
|                                   |                         | KPDES        |            |             |            |            |                     | 0.0043     |                   |            |                    | 0.0045         | 0.0045             | 0.0045              |                    |            |            |                      |            |            |                      |            |                |              |
| 4405                              | KYG401197               | WLA          |            |             |            |            |                     |            |                   |            |                    | 0.0045         | 0.0045             | 0.0045              |                    |            |            |                      |            |            |                      |            |                | 0.0045       |

| Loads are in units of              |                           |              |                  |                          |                   |                   |                    |                     |                     |                      |                     | Spewing             | Left Fork           |                    | Right<br>Fork       |                  |                  |                    |                       |                    |             |                      |                     |                        |
|------------------------------------|---------------------------|--------------|------------------|--------------------------|-------------------|-------------------|--------------------|---------------------|---------------------|----------------------|---------------------|---------------------|---------------------|--------------------|---------------------|------------------|------------------|--------------------|-----------------------|--------------------|-------------|----------------------|---------------------|------------------------|
| billion $\underline{\mathbf{E}}$ . | Percent                   |              | 0.11             |                          | Y 1               | 0,11              | Left Fork          | P                   | Simpson             | 0 1 1                | Sizemore            | Camp                | Beaver              | Left Fork          | Beaver              |                  |                  | Right Fork         | Q to X : 1            | m 1                | Right Fork  |                      | Buck                |                        |
| coli<br>colonies/                  | Reduction is expressed as |              | Caleb<br>Fork RM | Clear Creek<br>RM 0.0 to | Jacks<br>Creek RM | Otter<br>Creek RM | Beaver<br>Creek RM | Frasure<br>Creek RM | Branch<br>RM 0.0 to | Spurlock<br>Creek RM | Branch<br>RM 0.0 to | Branch<br>RM 0.0 to | Creek RM<br>11.4 to | Beaver<br>Creek RM | Creek RM<br>30.3 to | Caney<br>Fork RM | Jones<br>Fork RM | Beaver<br>Creek RM | Salt Lick<br>Creek RM | Turkey<br>Creek RM |             | Arkansas<br>Creek RM | Branch<br>RM 0.0 to | Beaver<br>Creek 0.0 to |
| day                                | a percentage              | KPDES        | 0.0 to 1.2       | 4.9                      | 0.0 to 4.4        | 0.0 to 0.5        | 18.7 to 28.6       | 0.0 to 5.2          | 1.8                 | 0.0 to 0.6           | 2.0                 | 3.1                 | 13.55               | 0.0 to 11.4        | 33.4                | 0.0 to 7.5       | 0.0 to 9.9       | 17.4 to 23.3       | 0.0 to 6.8            | 0.0 to 5.9         | 0.0 to 17.4 | 0.0 to 3.6           | 2.8                 | 7.1                    |
| 12253                              | KYG401218                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045      |                      |                     | 0.0045                 |
| 15635                              | KYG401271                 | WLA          |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
| 15655                              | KYG401296                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045      |                      |                     | 0.0045                 |
| 15807                              | KYG401352                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045      |                      |                     | 0.0045                 |
|                                    |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045      |                      |                     | 0.0045                 |
|                                    |                           | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    | 0.0525              |                  |                  | 0.052.5            |                       |                    | 0.0045      |                      |                     |                        |
|                                    | KY0077542                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    | 0.0636              |                  |                  | 0.0636             |                       |                    |             |                      |                     | 0.0636                 |
| 35251                              | KY0089435                 | WLA<br>KPDES |                  |                          |                   |                   | 0.0618             |                     |                     |                      |                     |                     | 0.0618              | 0.0618             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0618                 |
| 35252                              | KY0079421                 | WLA<br>KPDES |                  |                          |                   |                   |                    | 0.1363              |                     |                      |                     |                     |                     | 0.1363             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.1363                 |
| 35254                              | KY0079430                 | WLA          |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0999      |                      |                     | 0.0999                 |
| 35258                              | KY0093017                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0727      |                      |                     | 0.0727                 |
| 35260                              | KY0093912                 | KPDES<br>WLA |                  |                          |                   |                   | 0.1363             |                     |                     |                      |                     |                     | 0.1363              | 0.1363             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.1363                 |
|                                    | KY0107051                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.2271      |                      |                     | 0.2271                 |
|                                    |                           | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  | 0.0545           |                    |                       |                    | 0.0545      |                      |                     | 0.0545                 |
|                                    | KY0087076                 | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  | 0.0545           |                    |                       |                    |             |                      |                     |                        |
|                                    | KY0105228                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  | 0.9085             |                       |                    | 0.9085      |                      |                     | 0.9085                 |
| 35887                              | KYG401533                 | WLA<br>KPDES |                  |                          |                   |                   |                    | 0.0045              |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
| 35892                              | KYG401529                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
| 36057                              | KYG401541                 | WLA          |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
| 40534                              | KY0028789                 | KPDES<br>WLA |                  |                          |                   | 2.0441            | 2.0441             |                     |                     |                      |                     |                     | 2.0441              | 2.0441             |                     |                  |                  |                    |                       |                    |             |                      |                     | 2.0441                 |
| 43120                              | KYG401540                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045      |                      |                     | 0.0045                 |
|                                    | KYG401548                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045      |                      |                     | 0.0045                 |
|                                    |                           | KPDES        |                  |                          |                   | 0.0045            | 0.0045             |                     |                     |                      |                     |                     | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    | 0.0043      |                      |                     |                        |
|                                    | KYG401580                 | KPDES        |                  |                          |                   | 0.0045            | 0.0045             |                     |                     |                      |                     |                     | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
|                                    | KYG401590                 | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
| 45073                              | KYG401582                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
| 45396                              | KYG401587                 | WLA<br>KPDES |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
| 46144                              | KYG401601                 | WLA          |                  |                          |                   |                   |                    |                     |                     | 0.0045               |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
| 46147                              | KYG401603                 |              |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  | 0.0045           |                    |                       |                    | 0.0045      |                      |                     | 0.0045                 |
| 47022                              | KYG401638                 | KPDES<br>WLA |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    | 0.0045      |                      |                     | 0.0045                 |
|                                    | KYG401645                 | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
|                                    |                           | KPDES        |                  |                          |                   |                   | 0.0045             |                     |                     |                      |                     |                     | 0.0045              |                    |                     |                  |                  |                    |                       |                    |             |                      |                     |                        |
|                                    | KYG401646                 | KPDES        |                  |                          |                   |                   | 0.0045             |                     |                     |                      |                     |                     | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
|                                    | KYG401654                 | KPDES        |                  |                          |                   |                   |                    |                     |                     |                      |                     | 0.0045              | 0.0045              | 0.0045             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
| 50021                              | KYG401692                 | WLA<br>KPDES |                  |                          |                   |                   |                    | 0.0045              |                     |                      |                     |                     |                     | 0.0045             |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |
| 50138                              | KYG401699                 | WLA          |                  |                          |                   |                   |                    |                     |                     |                      |                     |                     |                     |                    |                     |                  |                  |                    |                       |                    |             |                      |                     | 0.0045                 |

Final
Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

September, 2010

| - I                   | 1            |                     |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    | D: 1.         |                   |                    |                    |                   |                   |                     |                   |                   | 1                    |
|-----------------------|--------------|---------------------|--------------------|-------------------|-------------------|-------------------|--------------------|-------------------|-------------------|-------------------|------------------|-------------------|-------------------|--------------------|---------------|-------------------|--------------------|--------------------|-------------------|-------------------|---------------------|-------------------|-------------------|----------------------|
| Loads are in units of |              |                     |                    |                   |                   |                   |                    |                   |                   |                   |                  | Spewing           | Left Fork         |                    | Right<br>Fork |                   |                    |                    |                   |                   |                     |                   |                   |                      |
| billion <u>E</u> .    | Percent      |                     |                    |                   |                   |                   | Left Fork          |                   | Simpson           |                   | Sizemore         | Camp              | Beaver            | Left Fork          | Beaver        |                   |                    | Right Fork         |                   |                   | Right Fork          |                   | Buck              | 1                    |
| <u>coli</u>           | Reduction is |                     | Caleb              | Clear Creek       | Jacks             | Otter             | Beaver             | Frasure           | Branch            | Spurlock          | Branch           | Branch            | Creek RM          | Beaver             | Creek RM      | Caney             | Jones              | Beaver             | Salt Lick         | Turkey            | Beaver              | Arkansas          | Branch            | Beaver               |
| colonies/             | expressed as |                     | Fork RM            | RM 0.0 to         | Creek RM          | Creek RM          | Creek RM           | Creek RM          | RM 0.0 to         | Creek RM          | RM 0.0 to        | RM 0.0 to         | 11.4 to           | Creek RM           | 30.3 to       | Fork RM           | Fork RM            | Creek RM           | Creek RM          | Creek RM          | Creek RM            | Creek RM          | RM 0.0 to         | Creek 0.0 to         |
| day                   | a percentage | KPDES               | 0.0 to 1.2         | 4.9               | 0.0 to 4.4        | 0.0 to 0.5        | 18.7 to 28.6       | 0.0 to 5.2        | 1.8               | 0.0 to 0.6        | 2.0              | 3.1               | 13.55             | 0.0 to 11.4        | 33.4          | 0.0 to 7.5        | 0.0 to 9.9         | 17.4 to 23.3       | 0.0 to 6.8        | 0.0 to 5.9        | 0.0 to 17.4         | 0.0 to 3.6        | 2.8               | 7.1                  |
| 50627                 | KYG401721    | WLA                 |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   | 0.0045            | 0.0045              |                   |                   | 0.0045               |
| 50950                 | KYG401730    | KPDES<br>WLA        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    | 0.0045            |                   | 0.0045              |                   |                   | 0.0045               |
| 53921                 | KYG401764    | KPDES<br>WLA        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   |                     | 0.0045            |                   | 0.0045               |
|                       |              | KPDES               |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   |                     | 0.0043            |                   |                      |
|                       |              | WLA<br>KPDES        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   | 0.0045              |                   |                   | 0.0045               |
| 71436                 | KYG401809    | WLA<br>KPDES        |                    |                   |                   |                   |                    | 0.0045            |                   |                   |                  |                   |                   | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
| 74022                 | KYG401406    | WLA                 |                    |                   |                   |                   |                    |                   | 0.0045            |                   |                  |                   |                   | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
| 74025                 | KYG401409    | KPDES<br>WLA        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
| 74062                 | KYG401442    | KPDES<br>WLA        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   | 0.0045            | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
|                       |              | KPDES<br>WLA        |                    |                   |                   |                   | 0.0045             |                   |                   |                   |                  |                   | 0.0045            | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
|                       |              | KPDES               |                    |                   |                   |                   | 0.0045             |                   |                   |                   |                  |                   | 0.0045            | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   |                      |
| /4185                 | KYG401475    | WLA<br>KPDES        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    | 0.0045            |                   | 0.0045              |                   |                   | 0.0045               |
| 74243                 | KYG401821    | WLA<br>KPDES        |                    |                   |                   |                   |                    | 0.0045            |                   |                   |                  |                   |                   | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
| 75141                 | KYG401851    | WLA                 |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
| 75556                 | KYG401857    | KPDES<br>WLA        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   | 0.0045              |                   |                   | 0.0045               |
| 75746                 | KYG401868    | KPDES<br>WLA        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   |                     |                   | 0.0045            | 0.0045               |
| 76078                 |              | KPDES<br>WLA        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   | 0.0045              |                   | 0.000             | 0.0045               |
|                       |              | KPDES               |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   | 0.0043              | 0.0045            |                   |                      |
|                       |              | WLA<br>KPDES        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   |                     | 0.0045            |                   | 0.0045               |
| 79525                 | KYG401931    | WLA<br>KPDES        |                    |                   |                   |                   |                    | 0.0045            |                   |                   |                  |                   |                   | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
| 79842                 | KYG401936    | WLA<br>KPDES        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
| 81193                 | KYG401970    | WLA                 |                    |                   |                   |                   |                    | 0.0045            |                   |                   |                  |                   |                   | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
| 81570                 | KYG401981    | KPDES<br>WLA        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   | 0.0045              |                   |                   | 0.0045               |
| 82092                 | KY0106755    | KPDES<br>WLA        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   | 0.0545              |                   |                   | 0.0545               |
|                       | KYG402002    | KPDES               |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
|                       |              | KPDES               |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   | 0.0045             |               |                   |                    |                    |                   |                   | 0.0017              |                   |                   |                      |
|                       | KYG402025    | KPDES               |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   | 0.0045              |                   |                   | 0.0045               |
| 97291                 | KYG402063    | WLA<br>KPDES        |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   | 0.0045              |                   |                   | 0.0045               |
| 103052                | KYG402117    |                     |                    |                   |                   |                   |                    | 0.0045            |                   |                   |                  |                   |                   | 0.0045             |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0045               |
| 1297                  | KY0027413    | WLA                 |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   |                     |                   |                   | 0.0000               |
|                       |              | Total<br>KPDES      |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   |                     |                   |                   |                      |
|                       |              | WLA                 | 0.000              | 0.0135            | 0.0045            | 2.0486            | 2.2602             | 0.1903            | 0.0045            | 0.018             | 0.018            | 0.009             | 2.2962            | 3.0206             | 0.0636        | 0.9085            | 0.1771             | 1.8941             | 0.0225            | 0.0135            | 2.8104              | 0.0315            | 0.018             | 7.060855             |
|                       |              | remainder<br>Future | 14.2684            | 37.5193           | 42.8048           | 24.1043           | 184.7351           | 82.4207           | 13.7395           | 26.9497           | 11.0959          | 17.9667           | 281.4776          | 513.5661           | 226.6502      | 1/1.1002          | 162.7481           | 545.5453           | 88.7791           | 36.9909           | 1080.2555           | 21.6637           | 19.5512           | 1667.1549            |
|                       |              | Growth              |                    |                   |                   |                   |                    |                   |                   |                   |                  |                   |                   |                    |               |                   |                    |                    |                   |                   |                     |                   |                   |                      |
|                       |              | <b>WLA</b> (1)      | 0.0713             | 0.3752            | 0.4280            | 0.2410            | 1.8474             | 0.8242            | 0.0687            | 0.2695            | 0.1110           | 0.0898            | 2.8148            | 5.1357             | 2.2665        | 0.8555            | 0.8137             | 5.4555             | 0.8878            | 0.1850            | 10.8026             | 0.2166            | 0.1955            | 16.6715              |
|                       |              | Total               | 0.07124            | 0.2007            | 0.4225            | 2 2007            | 4.1076             | 1.0145            | 0.0722            | 0.2075            | 0.120            | 0.0000            | E 111             | 0.15(2             | 2 2201        | 1.764             | 0.0000             | 7 3 40 6           | 0.0102            | 0.1005            | 12 (12              | 0.2401            | 0.2125            | 22 7224              |
|                       |              | WLA<br>LA           | 0.07134<br>14.1971 | 0.3887<br>37.1441 | 0.4325<br>42.3768 | 2.2896<br>23.8633 | 4.1076<br>182.8877 | 1.0145<br>81.5965 | 0.0732<br>13.6708 | 0.2875<br>26.6802 | 0.129<br>10.9849 | 0.0988<br>17.8769 | 5.111<br>278.6628 | 8.1563<br>508.4304 | 2.3301        | 1.764<br>170.2447 | 0.9908<br>161.9343 | 7.3496<br>540.0899 | 0.9103<br>87.8913 | 0.1985<br>36.8059 | 13.613<br>1069.4529 | 0.2481<br>21.4471 | 0.2135<br>19.3557 | 23.7324<br>1650.4834 |
| Nieta, (1)            | A din        |                     | VDDEC              |                   |                   |                   |                    | the Enture (      |                   |                   |                  |                   |                   |                    |               |                   |                    |                    | 07.0710           | 00.000            | 1007,7027           | 21,77/1           | 17.0001           | 1000,1007            |

Note: (1) Any expanding or future KPDES-permitted point source will receive its WLA from the Future Growth WLA and must meet permit limits based on the Water Quality Standards in 401 KAR 10:031.8.24

### **8.24 Translation of WLAs into Permit Limits**

All WLAs will be translated into KPDES permit limits as an  $\underline{E}$ .  $\underline{coli}$  effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average or as a Fecal coliform effluent gross limit of 200 colonies/100 ml as a monthly average and 400 colonies/100 ml as a maximum weekly average.

### 9.0 Implementation

Section 303(e) of the Clean Water Act and 40 CFR Part 130, Section 130.5, require states to have a continuing planning process (CPP) composed of several parts specified in the Act and the regulation. The CPP provides an outline of agency programs and the available authority to address water issues. Under the CPP umbrella, the Watershed Management Branch will provide technical support and leadership with developing and implementing watershed plans to address water quality and quantity problems and threats. Developing watershed plans enables more effective targeting of limited restoration funds and resources, thus improving environmental benefit, protection and recovery.

The in-stream pathogen data used to develop the TMDLs for impaired segments in the Beaver Creek Watershed do not allow loads to be quantitatively allocated to the different sources within the watershed. Therefore, no specific recommendations for remediation are offered until additional watershed planning is conducted. Development of a watershed plan will provide an integrative approach for identifying and describing what actions that should be taken in order to meet WQC, how the actions will be accomplished, who will undertake the actions and when the actions will be completed. This TMDL will provide a foundation for developing a detailed watershed plan. At present, no watershed plan is under development for the Beaver Creek watershed. However, KDOW welcomes future planning efforts by third parties (i.e., local stakeholders) for watershed plans and BMP implementation.

### 10.0 Public Participation

This TMDL was published for a 30-day public comment beginning August 4, 2010 and ending September 3, 2010. A notification was sent to all newspapers in the Commonwealth of Kentucky and advertisements were purchased in three local newspapers in the vicinity of the Beaver Creek watershed: The Floyd County Times (Prestonsburg, KY in Floyd County, circulation 3923), The Appalachian News-Express (Pikeville, KY in Pike County, circulation 7100), and the Troublesome Creek Times (Hindman, KY in Knott County, circulation 4665). Additionally, the public notice was distributed electronically through the 'Nonpoint Source Pollution Control' mailing list and via SNIPS, an electronic news bulletin sent to approximately 1,600 entities. No public comments were received on this TMDL document.

#### 11.0 References

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### Appendix A. Land Cover Definitions

Table A.1 National Land-Cover Database Class Descriptions (taken from Homer et. al., 2004)

- 11. Open Water All areas of open water, generally with less than 25% cover of vegetation or soil.
- 21. **Developed, Open Space** Includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes
- 22. **Developed, Low Intensity** Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-49 percent of total cover. These areas most commonly include single-family housing units.
- 23. **Developed, Medium Intensity** Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-79 percent of the total cover. These areas most commonly include single-family housing units.
- 24. **Developed, High Intensity** Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to 100 percent of the total cover.
- 31. **Barren Land (Rock/Sand/Clay)** Barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.
- 41. **Deciduous Forest** Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change.
- 42. **Evergreen Forest** Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year. Canopy is never without green foliage.
- 43. **Mixed Forest** Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover.
- 52. **Shrub/Scrub** Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.
- 71. **Grassland/Herbaceous** Areas dominated by grammanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.
- 81. **Pasture/Hay** Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.
- 82. **Cultivated Crops** Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled.
- 90. **Woody Wetlands** Areas where forest or shrubland vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.
- 95. **Emergent Herbaceous Wetlands** Areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

# Appendix B. <u>E</u>. <u>coli</u> Monitoring Data

| 6.1    | S                              | T - 424 - 1 -           | T 'A 1 -              | D.4.                    | E. coli<br>(colonies/ | Flow           |
|--------|--------------------------------|-------------------------|-----------------------|-------------------------|-----------------------|----------------|
| Site 1 | Segment Buck Branch 0.0 to 2.8 | <b>Latitude</b> 37.5706 | Longitude<br>-82.7562 | <b>Date</b><br>05/16/08 | 100ml)<br>1700        | (cfs)<br>1.132 |
| 1      | Buck Branch 0.0 to 2.8         | 37.3700                 | -82.7362              | 05/30/08                | 2500                  | 0.223          |
|        |                                |                         |                       | 06/13/08                | 1700                  | 0.223          |
|        |                                |                         |                       | 06/27/08                | 740                   | 0.117          |
|        |                                |                         |                       | 6/27/08 (QA sample)     | 460                   | N/A            |
|        |                                |                         |                       | 07/11/08                | 3000                  | 0.323          |
|        |                                |                         |                       | 07/31/08                | 64000                 | 1.003          |
|        |                                |                         |                       | 08/08/08                | 2700                  | 0.3072         |
|        |                                |                         |                       | 08/22/08                | 170                   | 0.0885         |
|        |                                |                         |                       | 09/12/08                | 700                   | 0.078          |
|        |                                |                         |                       | 09/20/08                | 560                   | 0.056          |
|        |                                |                         |                       | 10/17/08                | 300                   | 0.117          |
|        |                                |                         |                       | 10/24/08                | 250                   | 0.114          |
| 2      | Arkansas Creek 0.0 to 3.6      | 37.5781                 | -82.7317              | 05/16/08                | 580                   | 0.8            |
|        |                                |                         |                       | 05/30/08                | 70                    | 0.142          |
|        |                                |                         |                       | 06/13/08                | 140                   | 0.155          |
|        |                                |                         |                       | 06/27/08                | 50                    | 0.902          |
|        |                                |                         |                       | 07/11/08                | 680                   | 0.541          |
|        |                                |                         |                       | 07/31/08                | >80000                | 1.541          |
|        |                                |                         |                       | 08/08/08                | 340                   | 25.5346        |
|        |                                |                         |                       | 08/22/08                | 130                   | 8.3208         |
|        |                                |                         |                       | 09/12/08                | 140                   | 0.0511         |
|        |                                |                         |                       | 09/20/08                | 290                   | 0.013          |
|        |                                |                         |                       | 10/17/08                | 2400                  | 0.14           |
|        |                                |                         |                       | 10/24/08                | 110                   | 0.03           |
| 3      | Beaver Creek 0.0 to 7.1        | 37.5795                 | -82.732               | 05/16/08                | 1100                  | N/A            |
|        |                                |                         |                       | 05/30/08                | 130                   | 43.987         |
|        |                                |                         |                       | 06/13/08                | 430                   | 45.528         |
|        |                                |                         |                       | 06/27/08                | 180                   | 18.869         |
|        |                                |                         |                       | 07/11/08                | 610                   | 60.4           |
|        |                                |                         |                       | 7/11/08 (QA Sample)     | 550                   | N/A            |
|        |                                |                         |                       | 07/31/08                | 4500                  | N/A            |
|        |                                |                         |                       | 08/08/08                | 240                   | 0.0075         |
|        |                                |                         |                       | 09/12/08                | 390                   | 23.475         |
|        |                                |                         |                       | 09/20/08                | 90                    | 9.925          |
|        |                                |                         |                       | 10/17/08                | 90                    | 9.692          |
|        |                                |                         |                       | 10/24/08                | 750                   | 9.081          |

|        |                                      |          |           |                      | E. coli<br>(colonies/ | Flow       |
|--------|--------------------------------------|----------|-----------|----------------------|-----------------------|------------|
| Site   | Segment                              | Latitude | Longitude | Date                 | 100ml)                | (cfs)      |
| PRI095 | Beaver Creek 0.0 to 7.1              | 37.6028  | -82.72754 | 5/17/07              | 2700                  | N/A        |
|        |                                      |          |           | 6/14/07              | 656                   | N/A        |
|        |                                      |          |           | 7/19/07              | 426                   | N/A        |
|        |                                      |          |           | 8/14/07              | 500                   | N/A        |
|        |                                      |          |           | 9/20/07<br>10/18/07  | 268<br>261            | N/A<br>N/A |
|        |                                      |          |           | 5/21/08              | 450                   | N/A        |
|        |                                      |          |           | 6/17/08              | 19000                 | N/A        |
|        |                                      |          |           | 7/16/08              | 220                   | N/A        |
|        |                                      |          |           | 10/15/08             | 240                   | N/A        |
| 4      | Beaver Creek 0.0 to 7.1              | 37.61178 | -82.73071 | 05/16/08             | 300                   | N/A        |
|        |                                      |          |           | 05/30/08             | 290                   | 33.798     |
|        |                                      |          |           | 06/13/08             | 630                   | 34.654     |
|        |                                      |          |           | 06/27/08             | 180                   | 22.534     |
|        |                                      |          |           | 07/11/08             | 1500                  | 64.465     |
|        |                                      |          |           | 07/31/08             | 1900                  | N/A        |
|        |                                      |          |           | 08/08/08             | 270                   | 23.691     |
|        |                                      |          |           | 08/22/08             | 250                   | 6.8769     |
|        |                                      |          |           | 09/12/08             | 90                    | 18.639     |
|        |                                      |          |           | 09/20/08             | 380                   | 11.850     |
|        |                                      |          |           | 9/20/08 (QA Sample)  | 190                   | N/A        |
|        |                                      |          |           | 10/17/08             | 210                   | 8.251      |
|        |                                      |          |           | 10/24/08             | 70                    | 11.35      |
|        |                                      |          |           | 10/24/08 (QA Sample) | 70                    | N/A        |
| 13     | Right Fork Beaver Creek 30.3 to 33.4 | 37.35989 | -82.78935 | 05/15/07             | 260                   | 18.872     |
|        |                                      |          |           | 05/30/07             | 190                   | 1.976      |
|        |                                      |          |           | 06/13/07             | 320                   | 4.861      |
|        |                                      |          |           | 06/27/07             | 560                   | 55.059     |
|        |                                      |          |           | 07/10/07             | 370                   | 1.537      |
|        |                                      |          |           | 7/10/07 (QA Sample)  | 330                   | 1.537      |
|        |                                      |          |           | 07/26/07             | 1900                  | 14.412     |
|        |                                      |          |           | 08/17/07             | 320                   | 1.384      |
|        |                                      |          |           | 08/31/07             | 210                   | N/A        |
|        |                                      |          |           | 09/13/07             | 110                   | 1.829      |
|        |                                      |          |           | 09/28/07             | 110                   | 0.59       |
|        |                                      |          |           | 10/12/07             | <10                   | 0.612      |
|        |                                      |          |           | 10/12/07 (QA Sample) | <10                   | 0.612      |
|        |                                      |          |           | 11/16/07             | 430                   | 1.4244     |

| Site | Segment                    | Latitude | Longitude | Date                 | E. coli<br>(colonies/<br>100ml) | Flow<br>(cfs)  |
|------|----------------------------|----------|-----------|----------------------|---------------------------------|----------------|
| 20   | Jones Fork 0.0 to 9.9      | 37.46684 | -82.83148 | 05/15/07             | 140                             | 1.219          |
|      |                            |          |           | 05/30/07             | 320                             | 3.587          |
|      |                            |          |           | 06/13/07             | 280                             | 2.101          |
|      |                            |          |           | 06/27/07             | 3100                            | 2.128          |
|      |                            |          |           | 07/10/07             | 370                             | 1.062          |
|      |                            |          |           | 07/26/07             | 4300                            | 4.294          |
|      |                            |          |           | 08/17/07             | 20                              | 0.455          |
|      |                            |          |           | 08/31/07             | 290                             | 0.217          |
|      |                            |          |           | 09/14/07             | 180                             | 0.304          |
|      |                            |          |           | 9/14/07 (QA/Sample)  | 70                              | N/A            |
|      |                            |          |           | 09/28/07             | 170                             | 0.107          |
|      |                            |          |           | 10/12/07             | <10                             | 0.035          |
|      |                            |          |           | 11/16/07             | 120                             | 4.091          |
| 22   | Rock Fork 0.0 to 7.0       | 37.48001 | -82.83621 | 05/16/07             | 160                             | 5.226          |
|      |                            |          |           | 05/30/07             | 70                              | 2.975          |
|      |                            |          |           | 06/13/07             | 50                              | 2.315          |
|      |                            |          |           | 06/27/07             | 1600                            | 2.025          |
|      |                            |          |           | 07/10/07             | 80                              | 1.705          |
|      |                            |          |           | 07/26/07             | 1900                            | 1.887          |
|      |                            |          |           | 08/17/07             | 60                              | 1.485          |
|      |                            |          |           | 08/31/07             | 60                              | N/A            |
|      |                            |          |           | 09/14/07             | 200                             | 1.924          |
|      |                            |          |           | 09/28/07<br>10/12/07 | 110<br>100                      | 0.955<br>1.023 |
|      |                            |          |           | 10/12/07 (QA Sample) | 90                              | N/A            |
|      |                            |          |           | 11/16/07             | 600                             | 1.597          |
| 24   | Salt Lick Creek 0.0 to 6.8 | 37.49563 | 82.84959  | 05/15/07             | 4100                            | 1.608          |
|      |                            |          |           | 05/30/07             | 755                             | 1.035          |
|      |                            |          |           | 06/13/07             | 48000                           | 0.299          |
|      |                            |          |           | 06/27/07             | 66000                           | 1.504          |
|      |                            |          |           | 07/10/07             | 800                             | 0.117          |
|      |                            |          |           | 07/26/07             | 1400                            | 0.596          |
|      |                            |          |           | 08/17/07             | 90                              | N/A            |
|      |                            |          |           | 08/31/07             | 10                              | N/A            |
|      |                            |          |           | 8/31/07 (QA Sample)  | 30                              | N/A            |
|      |                            |          |           | 09/14/07             | 28000                           | N/A            |
|      |                            |          |           | 09/28/07             | 140                             | N/A            |
|      |                            |          |           | 11/16/07             | 1100                            | N/A            |

| Site | Segment                             | Latitude | Longitude | Date                            | E. coli<br>(colonies/<br>100ml) | Flow<br>(cfs) |
|------|-------------------------------------|----------|-----------|---------------------------------|---------------------------------|---------------|
| 27   | Turkey Creek 0.0 to 5.9             | 37.53184 | 82.78877  | 05/16/07                        | 1600                            | 10.6148       |
| 27   | Turkey Creek 6.6 to 5.5             | 37.53101 | 02.70077  | 05/30/07                        | 2400                            | 0.389         |
|      |                                     |          |           | 06/13/07                        | 3300                            | 0.2           |
|      |                                     |          |           | 06/27/08                        | 2900                            | 0.411         |
|      |                                     |          |           | 07/10/07                        | 1100                            | 0.114         |
|      |                                     |          |           | 07/26/07                        | 170                             | 0.156         |
|      |                                     |          |           | 08/17/07                        | 59000                           | N/A           |
|      |                                     |          |           | 08/31/07                        | 1000                            | N/A           |
|      |                                     |          |           | 09/14/07                        | 16900                           | N/A           |
|      |                                     |          |           | 09/28/07                        | 4600                            | N/A           |
|      |                                     |          |           | 10/12/07                        | 3200                            | N/A           |
|      |                                     |          |           | 11/16/07                        | 2800                            | 0.449         |
|      | Right Fork Beaver Creek             |          |           | 11/10/07                        | 2000                            | 0.442         |
| 30   | 0.0 to 17.4                         | 37.55905 | -82.77234 | 05/16/07                        | 310                             | 70.79         |
|      |                                     |          |           | 05/30/07                        | 310                             | 29.77         |
|      |                                     |          |           | 5/30/07 (QA Sample)             | 490                             | N/A           |
|      |                                     |          |           | 06/13/07                        | 180                             | 19.27         |
|      |                                     |          |           | 06/27/07                        | 3700                            | 63.551        |
|      |                                     |          |           | 07/10/07                        | 220                             | 11.799        |
|      |                                     |          |           | 07/26/07                        | 13000                           | N/A           |
|      |                                     |          |           | 08/17/07                        | 210                             | 7.202         |
|      |                                     |          |           | 8/17/07 (QA Sample)<br>08/31/07 | 140<br>160                      | N/A<br>N/A    |
|      |                                     |          |           | 09/14/07                        | 180                             | N/A           |
|      |                                     |          |           | 09/14/07                        | 330                             | N/A           |
|      |                                     |          |           | 10/12/07                        | 40                              | 25.701        |
|      |                                     |          |           | 11/16/07                        | 110                             | 0.371         |
| 30a  | Right Fork Beaver Creek 0.0 to 17.4 | 37.5584  | -82.7555  | 05/16/08                        | 560                             | 65.85         |
|      |                                     |          |           | 05/30/08                        | 140                             | 26.3          |
|      |                                     |          |           | 06/13/08                        | 500                             | 26.876        |
|      |                                     |          |           | 06/27/08                        | 250                             | 10.230        |
|      |                                     |          |           | 07/11/08                        | 680                             | 44.002        |
|      |                                     |          |           | 07/31/08                        | 3800                            | N/A           |
|      |                                     |          |           | 08/08/08                        | 500                             | 22.4328       |
|      |                                     |          |           | 08/22/08                        | 150                             | 7.995         |
|      |                                     |          |           | 09/12/08                        | 110                             | 11.121        |
|      |                                     |          |           | 09/20/08                        | 120                             | 7.015         |
|      |                                     |          |           | 10/17/08                        | 50                              | 8.743         |
|      |                                     |          |           | 10/24/08                        | 90                              | 7.326         |

| Site | Segment                              | Latitude | Longitude | Date                | E. coli<br>(colonies/<br>100ml) | Flow<br>(cfs) |
|------|--------------------------------------|----------|-----------|---------------------|---------------------------------|---------------|
| Site | Right Fork Beaver Creek              | Latitude | Longitude | Date                | 1001111)                        | (CIS)         |
| 31   | 17.4 to 23.3                         | 37.4673  | -82.83    | 05/15/07            | 180                             | 3.172         |
|      |                                      |          |           | 05/30/07            | 200                             | 3.587         |
|      |                                      |          |           | 06/13/07            | 300                             | 10.346        |
|      |                                      |          |           | 06/27/07            | 4100                            | 16.049        |
|      |                                      |          |           | 07/10/07            | 150                             | N/A           |
|      |                                      |          |           | 07/26/07            | 2900                            | 41.221        |
|      |                                      |          |           | 08/17/07            | 430                             | 4.732         |
|      |                                      |          |           | 08/31/07            | 150                             | 2.551         |
|      |                                      |          |           | 09/14/07            | 220                             | 2.619         |
|      |                                      |          |           | 09/28/07            | 110                             | 1.429         |
|      |                                      |          |           | 9/28/07 (QA Sample) | 70                              | N/A           |
|      |                                      |          |           | 10/12/07            | 70                              | 1.481         |
|      |                                      |          |           | 11/16/07            | 180                             | 18.054        |
| 32   | Caney Fork 0.0 to 7.5                | 37.41672 | -82.79799 | 05/15/07            | 100                             | 151.9515      |
|      |                                      |          |           | 05/30/07            | 300                             | 4.797         |
|      |                                      |          |           | 06/13/07            | 110                             | 2.131         |
|      |                                      |          |           | 06/27/07            | 430                             | 5.698         |
|      |                                      |          |           | 07/10/07            | 210                             | 1.233         |
|      |                                      |          |           | 07/26/07            | 690                             | 20.379        |
|      |                                      |          |           | 08/17/07            | 400                             | 1.705         |
|      |                                      |          |           | 08/31/07            | 260                             | N/A           |
|      |                                      |          |           | 09/14/07            | 170                             | 0.105         |
|      |                                      |          |           | 09/28/07            | 30                              | 0.084         |
|      |                                      |          |           | 10/12/07            | <10                             | 0.275         |
|      |                                      |          |           | 11/16/07            | 710                             | 1.2337        |
| 33   | Right Fork Beaver Creek 23.3 to 30.3 | 37.4173  | -82.79682 | 05/15/07            | 150                             | 431.7758      |
|      |                                      |          | 0_00      | 05/30/07            | <10                             | 11.65         |
|      |                                      |          |           | 06/13/07            | 120                             | 5.073         |
|      |                                      |          |           | 06/27/07            | 330                             | 4.539         |
|      |                                      |          |           | 07/10/07            | 150                             | 2.844         |
|      |                                      |          |           | 07/26/07            | 2500                            | 20.381        |
|      |                                      |          |           | 08/17/07            | 100                             | 2.148         |
|      |                                      |          |           | 08/31/07            | 150                             | N/A           |
|      |                                      |          |           | 09/14/07            | 180                             | 2.088         |
|      |                                      |          |           | 09/28/07            | 10                              | N/A           |
|      |                                      |          |           | 10/12/07            | 20                              | N/A           |
|      |                                      |          |           | 11/16/07            | 290                             | 2.4992        |

|      |                         |          |            |                      | E. coli<br>(colonies/ | Flow            |
|------|-------------------------|----------|------------|----------------------|-----------------------|-----------------|
| Site | Segment                 | Latitude | Longitude  | Date                 | 100ml)                | (cfs)           |
| 2.4  | Right Fork Beaver Creek | 27.51206 | 02 02 (1 ( | 05/15/07             | 90                    | 10 505          |
| 34   | 0.0 to 17.4             | 37.51286 | -82.83616  | 05/15/07<br>05/30/07 | 80<br>290             | 18.505<br>24.19 |
|      |                         |          |            | 06/13/07             | 390                   | 18.952          |
|      |                         |          |            | 06/27/07             | 5900                  | 21.113          |
|      |                         |          |            | 07/10/07             | 300                   | 9.207           |
|      |                         |          |            | 07/26/07             | 5100                  | 69.501          |
|      |                         |          |            | 08/17/07             | 150                   | 7.962           |
|      |                         |          |            | 08/31/07             | 130                   | N/A             |
|      |                         |          |            | 09/14/07             | 210                   | 3.97            |
|      |                         |          |            | 09/28/07<br>10/12/07 | 100<br>120            | 1.933<br>3.6554 |
|      |                         |          |            | 11/17/07             | 3300                  | 19.807          |
|      |                         |          |            | 11/17/07 (QA Sample) | 2100                  | N/A             |
|      | Right Fork Beaver Creek |          |            | , <u> </u>           |                       |                 |
| 35   | 0.0 to 17.4             | 37.52986 | -82.79064  | 05/16/07             | 140                   | N/A             |
|      |                         |          |            | 05/30/07             | 190                   | 27.832          |
|      |                         |          |            | 06/13/07             | 340                   | N/A             |
|      |                         |          |            | 06/27/07             | 3500                  | N/A             |
|      |                         |          |            | 6/27/07 (QA Sample)  | 2400                  | N/A             |
|      |                         |          |            | 07/10/07             | 50                    | N/A             |
|      |                         |          |            | 07/26/07             | 6700                  | N/A             |
|      |                         |          |            | 7/26/07 (QA Sample)  | 1100                  | N/A             |
|      |                         |          |            | 08/17/07             | 170                   | 6.893           |
|      |                         |          |            | 08/31/07             | 70                    | N/A             |
|      |                         |          |            | 09/14/07             | 310                   | N/A             |
|      |                         |          |            | 09/28/07             | 640                   | N/A             |
|      |                         |          |            | 10/12/07             | 310                   | 2.925           |
|      |                         |          |            | 11/17/07             | 2600                  | N/A             |
| 36   | Caleb Fork 0.0 to 1.2   | 37.32805 | -82.68984  | 05/16/08             | 11000                 | 1.085           |
|      |                         |          |            | 05/30/08             | 17000                 | 4.3302          |
|      |                         |          |            | 06/13/08             | 3400                  | N/A             |
|      |                         |          |            | 6/13/08 (QA Sample)  | 2900                  | N/A             |
|      |                         |          |            | 06/27/08             | 3000                  | 0.326           |
|      |                         |          |            | 07/11/08             | 5300                  | N/A             |
|      |                         |          |            | 07/31/08             | 17000                 | 0.308           |
|      |                         |          |            | 08/08/08             | 3600                  | 0.260           |
|      |                         |          |            | 08/22/08             | 800                   | 0.07            |
|      |                         |          |            | 09/12/08             | 2600                  | 0.1             |
|      |                         |          |            | 09/20/08             | 5000                  | 0.0334          |
|      |                         |          |            | 10/17/08             | >80000                | 0.211           |
|      |                         |          |            | 10/24/08             | 240                   | 0.088           |

| Site | Segment                | Latitude | Longitude | Date                 | E. coli<br>(colonies/<br>100ml) | Flow<br>(cfs)  |
|------|------------------------|----------|-----------|----------------------|---------------------------------|----------------|
| 37   | Otter Creek 0.0 to 0.5 | 37.35389 | -82.7165  | 05/16/08             | 6000                            | 1.461          |
| 31   | Otter Creek 0.0 to 0.5 | 31.33307 | 02.7103   | 05/30/08             | 38000                           | 6.935          |
|      |                        |          |           | 06/13/08             | 2000                            | 1.1368         |
|      |                        |          |           | 06/27/08             | 490                             | 0.744          |
|      |                        |          |           | 07/11/08<br>07/31/08 | 2700<br>>80000                  | 1.787<br>1.959 |
|      |                        |          |           | 08/08/08             | 730                             | 0.931          |
|      |                        |          |           | 08/22/08             | 570                             | 0.224          |
|      |                        |          |           | 09/12/08             | 2900                            | 0.875          |
|      |                        |          |           | 09/20/08             | >80000                          | 0.3732         |
|      |                        |          |           | 10/17/08             | 2400                            | 0.417          |
|      |                        |          |           | 10/24/08             | 250                             | 0.289          |
| 38   | Jacks Creek 0.0 to 4.4 | 37.36347 | -82.73338 | 05/16/08             | 480                             | 2.623          |
|      |                        |          |           | 05/30/08             | 700                             | 17.677         |
|      |                        |          |           | 06/13/08             | 1000                            | 1.3287         |
|      |                        |          |           | 06/27/08             | 3700                            | 1.027          |
|      |                        |          |           | 07/11/08             | 450                             | 1.026          |
|      |                        |          |           | 07/31/08             | 9000                            | 4.856          |
|      |                        |          |           | 08/08/08             | 520                             | 1.164          |
|      |                        |          |           | 08/22/08             | 180                             | 0.714          |
|      |                        |          |           | 09/12/08             | 1800                            | 2.853          |
|      |                        |          |           | 09/20/08             | 560                             | 1.215          |
|      |                        |          |           | 10/17/08             | 600                             | 0.642          |
|      |                        |          |           | 10/17/08 (QA Sample) | 800                             | N/A            |
|      |                        |          |           | 10/24/08             | 90                              | 0.397          |
|      |                        |          |           | 10/24/08 (QA Sample) | 180                             | N/A            |
| 39   | Clear Creek 0.0 to 4.9 | 37.3885  | -82.73075 | 05/16/08             | 200                             | 1.045          |
|      |                        |          |           | 05/30/08             | 220                             | 0.9205         |
|      |                        |          |           | 06/13/08             | 710                             | 1.003          |
|      |                        |          |           | 06/27/08             | 310                             | 0.625          |
|      |                        |          |           | 6/27/08 (QA Sample)  | 330                             | N/A            |
|      |                        |          |           | 07/11/08             | 330                             | 0.692          |
|      |                        |          |           | 07/31/08             | >80000                          | 8.345          |
|      |                        |          |           | 7/31/08 (QA Sample)  | 31000                           | N/A            |
|      |                        |          |           | 08/08/08             | 290                             | 0.491          |
|      |                        |          |           | 08/22/08             | 470                             | 0.322          |
|      |                        |          |           | 09/12/08             | 1800                            | 0.656          |
|      |                        |          |           | 09/20/08             | 320                             | 0.1716         |
|      |                        |          |           | 10/17/08             | 280                             | 0.484          |
|      |                        |          |           | 10/24/08             | 120                             | 0.184          |

| Site | Segment                  | Latitude | Longitude | Date                 | E. coli<br>(colonies/<br>100ml) | Flow<br>(cfs) |
|------|--------------------------|----------|-----------|----------------------|---------------------------------|---------------|
|      | Spewing Camp Branch 0.0  |          |           |                      |                                 |               |
| 40   | to 3.1                   | 37.43039 | -82.73443 | 05/16/08             | 1300                            | N/A           |
|      |                          |          |           | 05/30/08             | <10                             | 0.122         |
|      |                          |          |           | 06/13/08             | 200                             | 0.0464        |
|      |                          |          |           | 6/13/08 (QA Sample)  | 300                             | N/A           |
|      |                          |          |           | 06/27/08             | 100                             | 0.0476        |
|      |                          |          |           | 07/11/08             | 310                             | 0.098         |
|      |                          |          |           | 07/31/08             | 52000                           | 25.9819       |
|      |                          |          |           | 08/08/08             | 40                              | 5.278         |
|      |                          |          |           | 08/22/08             | 90                              | 0.065         |
|      |                          |          |           | 8/22/08 (QA Sample)  | 160                             | N/A           |
|      |                          |          |           | 09/12/08             | 190                             | 0.522         |
|      |                          |          |           | 09/20/08             | <10                             | 0.065         |
|      |                          |          |           | 10/17/08             | 190                             | 0.0408        |
|      |                          |          |           | 10/17/08 (QA Sample) | 190                             | N/A           |
|      |                          |          |           | 10/24/08             | 10                              | 0.038         |
| 41   | Frasure Creek 0.0 to 5.2 | 37.4265  | -82.7088  | 05/16/08             | 2000                            | N/A           |
|      |                          |          |           | 05/30/08             | 1600                            | 0.9202        |
|      |                          |          |           | 06/13/08             | 170                             | 0.3155        |
|      |                          |          |           | 06/27/08             | 450                             | 0.29          |
|      |                          |          |           | 07/31/08             | 71000                           | 18.8592       |
|      |                          |          |           | 08/08/08             | 1700                            | 0.474         |
|      |                          |          |           | 8/8/08 (QA Sample)   | 360                             | N/A           |
|      |                          |          |           | 09/12/08             | 13000                           | 0.7636        |
| 42   | Frasure Creek 0.0 to 5.2 | 37.4556  | -82.7368  | 05/16/08             | 160                             | N/A           |
|      |                          |          |           | 05/30/08             | 400                             | 1.3342        |
|      |                          |          |           | 06/13/08             | 570                             | 6.321         |
|      |                          |          |           | 06/27/08             | 560                             | 0.8631        |
|      |                          |          |           | 07/31/08             | 43000                           | N/A           |
|      |                          |          |           | 08/08/08             | 440                             | 0.588         |
|      |                          |          |           | 08/22/08             | 900                             | 0.116         |
|      |                          |          |           | 8/22/08 (QA Sample)  | 1100                            | N/A           |
|      |                          |          |           | 09/12/08             | 3300                            | 0.709         |
|      |                          |          |           | 9/12/08 (QA Sample)  | 3600                            | N/A           |
|      |                          |          |           | 09/20/08             | 1900                            | 0.256         |
|      |                          |          |           | 10/17/08             | 3200                            | 0.476         |
|      |                          |          |           | 10/24/08             | 760                             | 0.211         |

| Site | Segment                                | Latitude | Longitude | Date                 | E. coli<br>(colonies/<br>100ml) | Flow<br>(cfs) |
|------|--|----------|-----------|----------------------|---------------------------------|---------------|
| Site | Sizemore Branch 0.0 to                 | Latitude | Dongituuc | Date                 | Toomij                          | (CIS)         |
| 43   | 2.0                                    | 37.47028 | -82.75408 | 05/16/08             | 800                             | N/A           |
|      |  |          |           | 05/30/08             | 270                             | 0.1229        |
|      |  |          |           | 5/30/08 (QA Sample)  | 220                             | N/A           |
|      |  |          |           | 06/13/08             | 300                             | 0.1023        |
|      |  |          |           | 06/27/08             | 760                             | 0.0669        |
|      |  |          |           | 07/31/08             | 9000                            | N/A           |
|      |  |          |           | 08/08/08             | 350                             | 0.152         |
|      |  |          |           | 08/22/08             | 700                             | 0.084         |
|      |  |          |           | 09/12/08             | 1700                            | 0.0865        |
|      |  |          |           | 09/20/08             | 39000                           | 0.154         |
|      |  |          |           | 9/20/08 (QA Sample)  | 27000                           | N/A           |
|      |  |          |           | 10/17/08             | 1200                            | 0.2832        |
|      |  |          |           | 10/24/08             | 72000                           | N/A           |
| 44   | Simpson Branch 0.0 to 1.8              | 37.476   | -82.74252 | 05/16/08             | 30                              | N/A           |
|      |  |          |           | 05/30/08             | 40                              | 0.2607        |
|      |  |          |           | 06/13/08             | 100                             | 0.9723        |
|      |  |          |           | 07/31/08             | 54000                           | N/A           |
|      |  |          |           | 08/08/08             | 210                             | 0.058         |
|      |  |          |           | 08/22/08             | 40                              | N/A           |
|      |  |          |           | 09/12/08             | 440                             | 0.0624        |
|      |  |          |           | 09/20/08             | 160                             | 0.077         |
|      |  |          |           | 10/24/08             | 1500                            | 0.0465        |
| 45   | Left Fork Beaver Creek<br>18.7 to 28.6 | 37.3539  | -82.7163  | 05/16/08             | 3900                            | 4.395         |
|      |  |          |           | 05/30/08             | 1400                            | 21.576        |
|      |  |          |           | 06/13/08             | 2500                            | 0.138         |
|      |  |          |           | 06/27/08             | 580                             | 1.103         |
|      |  |          |           | 07/11/08             | 310                             | 0.555         |
|      |  |          |           | 07/31/08             | >80000                          | 5.316         |
|      |  |          |           | 08/08/08             | 740                             | 0.689         |
|      |  |          |           | 08/22/08             | 600                             | 0.508         |
|      |  |          |           | 09/12/08             | 30000                           | 0.520         |
|      |  |          |           | 09/20/08             | 2000                            | 0.158         |
|      |  |          |           | 10/17/08             | 6800                            | 0.958         |
|      |  |          |           | 10/24/08             | 860                             | 0.433         |
|      |  |          |           | 10/24/08 (QA Sample) | 390                             | N/A           |

|      |   |          |           |                     | <u>E</u> . <u>coli</u><br>(colonies/ | Flow    |
|------|---|----------|-----------|---------------------|--------------------------------------|---------|
| Site | Segment                                 | Latitude | Longitude | Date                | 100ml)                               | (cfs)   |
| 46   | Left Fork Beaver Creek<br>18.7 to 28.6  | 37.38095 | 82.73524  | 05/16/08            | 800                                  | 8.799   |
| 70   | 10.7 to 20.0                            | 37.30073 | 02.73324  | 05/30/08            | 290                                  | 72.576  |
|      |   |          |           | 06/13/08            | 130                                  | 5.353   |
|      |   |          |           | 06/27/08            | 90                                   | 2.727   |
|      |   |          |           | 07/11/08            | 130                                  | 3.555   |
|      |   |          |           | 07/31/08            | >80000                               | 23.673  |
|      |   |          |           | 7/31/08 (QA Sample) | 17000                                | N/A     |
|      |   |          |           | 08/08/08            | 170                                  | 4.089   |
|      |   |          |           | 08/22/08            | 30                                   | 1.406   |
|      |   |          |           | 09/12/08            | 1100                                 | 3.633   |
|      |   |          |           | 09/20/08            | 30                                   | 1.2618  |
|      |   |          |           | 9/20/08 (QA Sample) | 50                                   | N/A     |
|      |   |          |           | 10/17/08            | 90                                   | 2.10    |
|      |   |          |           | 10/24/08            | 130                                  | 1.057   |
| 47   | Left Fork Beaver Creek<br>13.55 to 18.7 | 37.42999 | -82.73404 | 05/16/08            | 90                                   | N/A     |
|      |   |          |           | 05/30/08            | 300                                  | 7.0056  |
|      |   |          |           | 06/13/08            | 40                                   | 4.5576  |
|      |   |          |           | 06/27/08            | 40                                   | 2.8755  |
|      |   |          |           | 07/11/08            | 10                                   | 4.733   |
|      |   |          |           | 07/31/08            | 7500                                 | 26.059  |
|      |   |          |           | 08/08/08            | 210                                  | 0.032   |
|      |   |          |           | 8/8/08 (QA Sample)  | 250                                  | N/A     |
|      |   |          |           | 08/22/08            | 100                                  | 2.025   |
|      |   |          |           | 09/12/08            | 230                                  | 6.1594  |
|      |   |          |           | 09/20/08            | 30                                   | 3.2045  |
|      |   |          |           | 10/17/08            | 130                                  | 2.695   |
|      |   |          |           | 10/24/08            | 110                                  | 1.4958  |
|      | Left Fork Beaver Creek                  |          |           |                     |                                      |         |
| 48   | 11.4 to 13.55                           | 37.4478  | -82.7384  | 05/16/08            | 130                                  | N/A     |
|      |   |          |           | 05/30/08            | 100                                  | 9.071   |
|      |   |          |           | 06/13/08            | 80                                   | 7.686   |
|      |   |          |           | 06/27/08            | 250                                  | 4.4441  |
|      |   |          |           | 07/31/08            | 69000                                | N/A     |
|      |   |          |           | 08/08/08            | 250                                  | 6.695   |
|      |   |          |           | 08/22/08            | 100                                  | 1.373   |
|      |   |          |           | 09/12/08            | 2100                                 | 114.166 |
|      |   |          |           | 09/20/08            | 110                                  | 2.553   |
|      |   |          |           | 10/17/08            | 50                                   | 2.8575  |
|      |   |          |           | 10/24/08            | 190                                  | 1.4364  |

| Site | Segment                   | Latitude | Longitude | Date                 | E. coli<br>(colonies/<br>100ml) | Flow<br>(cfs) |
|------|---------------------------|----------|-----------|----------------------|---------------------------------|---------------|
| Sitt | Left Fork Beaver Creek    | Dantuuc  | Longitude | Date                 | 100111)                         | (CIS)         |
| 49   | 0.0 to 11.4               | 37.5064  | -82.7555  | 05/16/08             | 170                             | N/A           |
|      |                           |          |           | 05/30/08             | 30                              | 11.975        |
|      |                           |          |           | 5/30/08 (QA Sample)  | 20                              | N/A           |
|      |                           |          |           | 06/13/08             | 60                              | 7.4685        |
|      |                           |          |           | 06/27/08             | 110                             | 7.915         |
|      |                           |          |           | 07/31/08             | 53000                           | 37.108        |
|      |                           |          |           | 08/08/08             | 70                              | 8.333         |
|      |                           |          |           | 08/22/08             | <10                             | 1.803         |
|      |                           |          |           | 09/12/08             | 380                             | N/A           |
|      |                           |          |           | 9/12/08 (QA Sample)  | 240                             | N/A           |
|      |                           |          |           | 09/20/08             | 130                             | 1.8648        |
|      |                           |          |           | 10/17/08             | 100                             | 3.999         |
|      |                           |          |           | 10/24/08             | 170                             | 3.356         |
|      | Left Fork Beaver Creek    |          |           | 10/24/00             | 170                             | 3.330         |
| 50   | 0.0 to 11.4               | 37.5564  | -82.7497  | 05/16/08             | 390                             | N/A           |
|      |                           |          |           | 05/30/08             | 600                             | N/A           |
|      |                           |          |           | 06/13/08             | 220                             | N/A           |
|      |                           |          |           | 6/13/08 (QA Sample)  | 190                             | N/A           |
|      |                           |          |           | 06/27/08<br>07/11/08 | 70<br>390                       | N/A<br>12.956 |
|      |                           |          |           | 07/31/08             | 27000                           | N/A           |
|      |                           |          |           | 08/08/08             | 220                             | 5.708         |
|      |                           |          |           | 08/22/08             | 240                             | 0.0144        |
|      |                           |          |           | 09/12/08             | 16000                           | 22.148        |
|      |                           |          |           | 09/20/08             | 170                             | 3.596         |
|      |                           |          |           | 10/17/08             | 180                             | 3.155         |
|      |                           |          |           | 10/24/08             | 10                              | 3.413         |
| 51   | Spurlock Creek 0.0 to 0.6 | 37.5308  | -82.7422  | 05/16/08             | 500                             | 24.131        |
|      |                           |          |           | 05/30/08             | 4100                            | 15.727        |
|      |                           |          |           | 06/13/08             | 410                             | 11.539        |
|      |                           |          |           | 06/27/08             | 360                             | 7.051         |
|      |                           |          |           | 07/11/08             | 600                             | N/A           |
|      |                           |          |           | 07/31/08             | 49000                           | 46.941        |
|      |                           |          |           | 7/31/08 (QA Sample)  | 46000                           | 46.941        |
|      |                           |          |           | 08/08/08             | 400                             | 5.676         |
|      |                           |          |           | 08/22/08             | 450                             | 1.677         |
|      |                           |          |           | 09/12/08             | 1400                            | 20.251        |
|      |                           |          |           | 09/20/08             | 1100                            | 3.884         |
|      |                           |          |           | 10/17/08             | 600                             | 3.514         |
|      |                           |          |           | 10/24/08             | 10                              | 2.294         |

Final
Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

September, 2010

| Site | Segment                   | Latitude | Longitude | Date               | E. coli<br>(colonies/<br>100ml) | Flow<br>(cfs) |
|------|---------------------------|----------|-----------|--------------------|---------------------------------|---------------|
| 52   | Spurlock Creek 0.6 to 4.0 | 37.52725 | -82.73617 | 05/16/08           | 10                              | 2.113         |
|      |                           |          |           | 05/30/08           | 110                             | 0.498         |
|      |                           |          |           | 06/13/08           | 30                              | 0.538         |
|      |                           |          |           | 06/27/08           | 20                              | 0.721         |
|      |                           |          |           | 07/11/08           | 110                             | 0.832         |
|      |                           |          |           | 07/31/08           | >80000                          | 13.349        |
|      |                           |          |           | 08/08/08           | 60                              | 0.1285        |
|      |                           |          |           | 8/8/08 (QA Sample) | 40                              | N/A           |
|      |                           |          |           | 08/22/08           | <10                             | 0.072         |
|      |                           |          |           | 09/12/08           | 70                              | 0.801         |
|      |                           |          |           | 09/20/08           | 20                              | 0.601         |
|      |                           |          |           | 10/17/08           | 30                              | 0.633         |
|      |                           |          |           | 10/24/08           | <10                             | 0.505         |

# Appendix C. Discharge Monitoring Report Data

| EASTERN STP | KY0107051             | E. coli (colonies/100ml) |
|-------------|-----------------------|--------------------------|
| Month       | Average Concentration | Maximum Concentration    |
| 31-Dec-09   | 266                   | 1300                     |
| 30-Nov-09   | 606                   | 2420                     |
| 31-Oct-09   | 19                    | 89                       |
| 30-Sep-09   | 17                    | 61                       |
| 31-Aug-09   | 1                     | 2                        |
| 31-Jul-09   | 237                   | 1414                     |
| 30-Jun-09   | 1                     | 1                        |
| 31-May-09   | 289                   | 418                      |
| 30-Apr-09   | 57                    | 150                      |
| 31-Mar-09   | 358                   | 1400                     |
| 28-Feb-09   | 15                    | 30                       |
| 31-Jan-09   | 22                    | 50                       |
| 31-Dec-08   | 13                    | 20                       |
| 30-Nov-08   | C = NO DISCHARGE      |                          |
| 31-Oct-08   |                       |                          |
| 30-Sep-08   |                       |                          |
| 31-Aug-08   | C = NO DISCHARGE      |                          |
| 31-Jul-08   | C = NO DISCHARGE      |                          |
| 30-Jun-08   | C = NO DISCHARGE      |                          |

| KNOTT CO WATER & SEWER DIST | KY0042854             | E. coli (colonies/100ml) |
|-----------------------------|-----------------------|--------------------------|
| Month                       | Average Concentration | Maximum Concentration    |
| 31-Dec-09                   |                       |                          |
| 30-Nov-09                   | 6                     | 131                      |
| 31-Oct-09                   | 106                   | 2048                     |
| 30-Sep-09                   | 269                   | 2420                     |
| 31-Aug-09                   | 26                    | 131                      |
| 31-Jul-09                   | 34                    | 117                      |
| 30-Jun-09                   | 88                    | 120                      |
| 31-May-09                   | 26                    | 119                      |
| 30-Apr-09                   | 78                    | 261                      |
| 31-Mar-09                   | 5                     | 109                      |
| 28-Feb-09                   | 7                     | 66                       |
| 31-Jan-09                   | 320                   | > 2420                   |
| 31-Dec-08                   | 83                    | 409                      |
| 30-Nov-08                   | 37                    | 117                      |
| 31-Oct-08                   | 23                    | 82                       |
| 30-Sep-08                   | 6                     | 63                       |
| 31-Aug-08                   | 7                     | 173                      |

| KNOTT CO WATER & SEWER DIST | KY0042854                | E. coli (colonies/100ml) |
|-----------------------------|--------------------------|--------------------------|
| Month                       | Average Concentration    | Maximum Concentration    |
| 31-Jul-08                   | 5                        | 79                       |
| 30-Jun-08                   | 16                       | 101                      |
| 31-May-08                   | 3                        | 26                       |
| 30-Apr-08                   | 58                       | 2420                     |
| 31-Mar-08                   | 129                      | > 2420                   |
| 29-Feb-08                   | 10                       | 166                      |
| 31-Jan-08                   | 12                       | 34                       |
| 31-Dec-07                   | 4                        | 10                       |
| 30-Nov-07                   | 21                       | 488                      |
| 31-Oct-07                   | 41                       | > 2420                   |
| 30-Sep-07                   | 11                       | 281                      |
| 31-Aug-07                   | 4                        | 25                       |
|                             | rm reporting begins here | -                        |
| 31-Jul-07                   | 40                       | 5000                     |
| 30-Jun-07                   | BMDL                     | BMDL                     |
| 31-May-07                   | 19                       | 65                       |
| 30-Apr-07                   | 12                       | 20                       |
| 31-Mar-07                   | BMDL                     | BMDL                     |
| 2/29/2007                   | <10                      | <10                      |
| 31-Jan-07                   | <10                      | <10                      |

| MARTIN STP | KY0026921             | Fecal Coliform (colonies/100ml) |
|------------|-----------------------|---------------------------------|
| Month      | Average Concentration | Maximum Concentration           |
| 31-Dec-09  | J                     |                                 |
| 30-Nov-09  | BMDL                  | BMDL                            |
| 31-Oct-09  | BMDL                  | BMDL                            |
| 30-Sep-09  | 22                    | 109                             |
| 31-Aug-09  | BMDL                  | BMDL                            |
| 31-Jul-09  | BMDL                  | BMDL                            |
| 30-Jun-09  | BMDL                  | BMDL                            |
| 31-May-09  |                       |                                 |
| 30-Apr-09  | BMDL                  | BMDL                            |
| 31-Mar-09  | 13                    | 30                              |
| 28-Feb-09  | 14                    | 30                              |
| 31-Jan-09  | 53                    | 92                              |
| 31-Dec-08  | 10                    | 10                              |
| 30-Nov-08  | BMDL                  | BMDL                            |
| 31-Oct-08  | BMDL                  | BMDL                            |
| 30-Sep-08  | 18                    | 99                              |
| 31-Aug-08  | 11                    | 15                              |
| 31-Jul-08  | BMDL                  | BMDL                            |
| 30-Jun-08  | 49.51                 | 1214                            |

Final
Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

| MARTIN STP | KY0026921             | Fecal Coliform (colonies/100ml) |
|------------|-----------------------|---------------------------------|
| Month      | Average Concentration | Maximum Concentration           |
| 31-May-08  | 47                    | 79                              |
| 30-Apr-08  | 73                    | 1746                            |
| 31-Mar-08  | 30                    | 270                             |
| 29-Feb-08  | 23                    | 590                             |
| 31-Jan-08  | 19                    | 129                             |
| 31-Dec-07  | 40                    | 158                             |
| 30-Nov-07  | 665                   | 2828                            |
| 31-Oct-07  | 1863                  | 20976                           |
| 30-Sep-07  | BMDL                  | BMDL                            |
| 31-Aug-07  | 247                   | 150000                          |
| 31-Jul-07  | BMDL                  | BMDL                            |
| 30-Jun-07  |                       |                                 |
| 31-May-07  |                       |                                 |
| 30-Apr-07  | 11000                 | 11000                           |
| 31-Mar-07  | 28                    | 624                             |
| 28-Feb-07  |                       |                                 |
| 31-Jan-07  | < 10                  | < 10                            |

| WAYLAND STP | KY0105228                    | E. coli (colonies/100ml) |
|-------------|------------------------------|--------------------------|
| Month       | Average Concentration        | Maximum Concentration    |
| 31-Dec-09   |                              |                          |
| 30-Nov-09   |                              |                          |
| 31-Oct-09   |                              |                          |
| 30-Sep-09   |                              |                          |
| 31-Aug-09   |                              |                          |
| 31-Jul-09   | 7                            | 2420                     |
| 30-Jun-09   |                              |                          |
| 31-May-09   | < 1                          | < 1                      |
| 30-Apr-09   | 3                            | 10                       |
| 31-Mar-09   | < 10                         | < 10                     |
| 28-Feb-09   | 1122                         | 66000                    |
| 31-Jan-09   | 19                           | 270                      |
| 31-Dec-08   | 10                           | 10                       |
| fe          | cal coliform reporting begin | ns here                  |
| 30-Nov-08   | <10                          | <10                      |
| 31-Oct-08   | 10                           | 10                       |
| 30-Sep-08   | 15                           | 50                       |
| 31-Aug-08   | 10                           | 10                       |
| 31-Jul-08   | <10                          | <10                      |
| 30-Jun-08   | 10                           | 10                       |
| 31-May-08   | 10                           | 10                       |

Final
Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

| WAYLAND STP | KY0105228             | E. coli (colonies/100ml) |
|-------------|-----------------------|--------------------------|
| Month       | Average Concentration | Maximum Concentration    |
| 30-Apr-08   | <10                   | <10                      |
| 31-Mar-08   | 54                    | 600                      |
| 28-Feb-08   | 36                    | 600                      |
| 31-Jan-08   | <51                   | <600                     |
| 31-Dec-07   | BMDL                  | BMDL                     |
| 30-Nov-07   | BMDL                  | BMDL                     |
| 31-Oct-07   | BMDL                  | BMDL                     |
| 30-Sep-07   | 24                    | 350                      |
| 31-Aug-07   | BMDL                  | BMDL                     |
| 31-Jul-07   | BMDL                  | BMDL                     |
| 30-Jun-07   | 10                    | 10                       |
| 31-May-07   | BMDL                  | BMDL                     |
| 30-Apr-07   | BMDL                  | BMDL                     |
| 31-Mar-07   | BMDL                  | BMDL                     |
| 28-Feb-07   | <10                   | <10                      |
| 31-Jan-07   | <10                   | <10                      |

| WHEELWRIGHT STP | KY0028789             | E. coli (colonies/100ml) |
|-----------------|-----------------------|--------------------------|
| Month           | Average Concentration | Maximum Concentration    |
| 31-Dec-09       | 15                    | 31                       |
| 30-Nov-09       | 14                    | 23                       |
| 31-Oct-09       | 3                     | 5                        |
| 30-Sep-09       | 8                     | 20                       |
| 31-Aug-09       | 25                    | 119                      |
| 31-Jul-09       | 7                     | 25                       |
| 30-Jun-09       | 3                     | 11                       |
| 31-May-09       | 4                     | 12                       |
| 30-Apr-09       | 7                     | < 10                     |
| 31-Mar-09       | < 10                  | < 10                     |
| 28-Feb-09       | < 10                  | < 10                     |
| 31-Jan-09       | 10                    | 10                       |
| 31-Dec-08       | 68                    |                          |
| 30-Nov-08       | 10                    | 10                       |
| 31-Oct-08       | 38                    | 120                      |
| 30-Sep-08       | 84                    | 260                      |
| 31-Aug-08       | 18                    | 40                       |
| 31-Jul-08       | 54                    | 170                      |
| 30-Jun-08       | 40                    | 120                      |
| 31-May-08       | 53                    | 130                      |
| 30-Apr-08       | 10                    | 10                       |
| 31-Mar-08       | < 10                  | < 10                     |
| 29-Feb-08       | 68                    | 300                      |

Final
Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

| WHEELWRIGHT STP                      | KY0028789             | E. coli (colonies/100ml) |
|--------------------------------------|-----------------------|--------------------------|
| Month                                | Average Concentration | Maximum Concentration    |
| 31-Jan-08                            | < 10                  | < 10                     |
| 31-Dec-07                            | 18                    | 30                       |
| 30-Nov-07                            | 15                    | 30                       |
| 31-Oct-07                            | 16                    | 40                       |
| 30-Sep-07                            | 195                   | 710                      |
| 31-Aug-07                            | 14                    | 30                       |
| 31-Jul-07                            | 388                   | 1900                     |
| fecal coliform reporting begins here |                       |                          |
| 30-Jun-07                            | 41                    | 160                      |
| 31-May-07                            | 32                    | 360                      |
| 30-Apr-07                            | 66                    | 600                      |
| 31-Mar-07                            | 10                    | 10                       |
| 2/29/2007                            | 10                    | 10                       |
| 31-Jan-07                            | 14                    | 60                       |

| ALLEN CENTRAL HIGH SCHOOL | KY0079430             | E. coli (colonies/100ml) |
|---------------------------|-----------------------|--------------------------|
| Quarter Ending            | Average Concentration | Maximum Concentration    |
| 31-Dec-09                 |                       |                          |
| 30-Sep-09                 | 10                    | 10                       |
| 30-Jun-09                 | 163                   | 276                      |
| 31-Mar-09                 | 3                     | 3                        |
| 31-Dec-08                 | 20                    | 20                       |
| 30-Sep-08                 | 23                    | 548                      |
| 30-Jun-08                 | 101                   | < 2420                   |
| 31-Mar-08                 | 39                    | 39                       |
| 31-Dec-07                 | 22                    | 22                       |
| 30-Sep-07                 | 28                    | 2420                     |
| 30-Jun-07                 | 85                    | 2420                     |
| 31-Mar-07                 |                       |                          |

| BEAVER CREEK ELEM SCHOOL | KY0077542             | E. coli (colonies/100ml) |
|--------------------------|-----------------------|--------------------------|
| Quarter Ending           | Average Concentration | Maximum Concentration    |
| 31-Dec-09                | BMDL                  | BMDL                     |
| 30-Sep-09                | BMDL                  | BMDL                     |
| 30-Jun-09                | BMDL                  | BMDL                     |
| 31-Mar-09                | BMDL                  | BMDL                     |
| 31-Dec-08                | BMDL                  | BMDL                     |
| 30-Sep-08                | BMDL                  | BMDL                     |
| 30-Jun-08                | BMDL                  | BMDL                     |
| 31-Mar-08                | 1                     | 1                        |

| BEAVER CREEK ELEM SCHOOL | KY0077542             | E. coli (colonies/100ml) |
|--------------------------|-----------------------|--------------------------|
| Quarter Ending           | Average Concentration | Maximum Concentration    |
| 31-Dec-07                | BMDL                  | BMDL                     |
| 30-Sep-07                | BMDL                  | BMDL                     |
| 30-Jun-07                | 6                     | 6                        |

| JAMES A DUFF ELEM SCHOOL | KY0093017             | E. coli (colonies/100ml) |
|--------------------------|-----------------------|--------------------------|
| Quarter Ending           | Average Concentration | Maximum Concentration    |
| 31-Dec-09                | -                     |                          |
| 30-Sep-09                | 39                    | 39                       |
| 30-Jun-09                | 2                     | 2                        |
| 31-Mar-09                | 1                     | 1                        |
| 31-Dec-08                | 6                     | 6                        |
| 30-Sep-08                | 12                    | 12                       |
| 30-Jun-08                | 22                    | 22                       |
| 31-Mar-08                | 36                    | 36                       |
| 31-Dec-07                | 14                    | 14                       |
| 30-Sep-07                | 49                    | 49                       |
| 30-Jun-07                | 1                     | 1                        |
| 31-Mar-07                |                       |                          |

| JONES FORK ELEM SCHOOL | KY0087076             | E. coli (colonies/100ml) |
|------------------------|-----------------------|--------------------------|
| Quarter Ending         | Average Concentration | Maximum Concentration    |
| 31-Dec-09              | BMDL                  | BMDL                     |
| 30-Sep-09              | BMDL                  | BMDL                     |
| 30-Jun-09              | BMDL                  | BMDL                     |
| 31-Mar-09              | BMDL                  | BMDL                     |
| 31-Dec-08              | BMDL                  | BMDL                     |
| 30-Sep-08              | BMDL                  | BMDL                     |
| 30-Jun-08              | BMDL                  | BMDL                     |
| 31-Mar-08              | BMDL                  | BMDL                     |
| 31-Dec-07              | 9                     | 9                        |
| 30-Sep-07              | 150                   | 150                      |
| 30-Jun-07              | 4                     | 4                        |

| MAY VALLEY ELEM SCHOOL | KY0106755             | E. coli (colonies/100ml) |
|------------------------|-----------------------|--------------------------|
| Quarter Ending         | Average Concentration | Maximum Concentration    |
| 31-Dec-09              | _                     |                          |
| 30-Sep-09              | 24                    | 24                       |
| 30-Jun-09              | 21                    | 146                      |

| MAY VALLEY ELEM SCHOOL | KY0106755             | E. coli (colonies/100ml) |
|------------------------|-----------------------|--------------------------|
| Quarter Ending         | Average Concentration | Maximum Concentration    |
| 31-Mar-09              | 2                     | 2                        |
| 31-Dec-08              | 21                    | 21                       |
| 30-Sep-08              | BMDL                  | BMDL                     |
| 30-Jun-08              | 75                    | 1120                     |
| 31-Mar-08              | 12                    | 12                       |
| 31-Dec-07              | 117                   | > 2420                   |
| 30-Sep-07              | 4                     | 4                        |
| 30-Jun-07              | 84                    | 84                       |
| 31-Mar-07              |                       |                          |

| MCDOWELL ELEM SCHOOL | KY0079421             | E. coli (colonies/100ml) |
|----------------------|-----------------------|--------------------------|
| Month                | Average Concentration | Maximum Concentration    |
| 31-Jan-10            |                       |                          |
| 31-Dec-09            |                       |                          |
| 30-Nov-09            |                       |                          |
| 31-Oct-09            |                       |                          |
| 30-Sep-09            | BMDL                  | BMDL                     |
| 31-Aug-09            | 88                    | 88                       |
| 31-Jul-09            | BMDL                  | BMDL                     |
| 30-Jun-09            | BMDL                  | BMDL                     |
| 31-May-09            | BMDL                  | BMDL                     |
| 30-Apr-09            | BMDL                  | BMDL                     |
| 31-Mar-09            | BMDL                  | BMDL                     |
| 28-Feb-09            | BMDL                  | BMDL                     |
| 31-Jan-09            | BMDL                  | BMDL                     |
| 31-Dec-08            | 23                    | 23                       |
| 30-Nov-08            | BMDL                  | BMDL                     |
| 31-Oct-08            | 11                    | 11                       |
| 30-Sep-08            | 5                     | 5                        |
| 31-Aug-08            | BMDL                  | BMDL                     |
| 31-Jul-08            | BMDL                  | BMDL                     |
| 30-Jun-08            | 35                    | 35                       |
| 31-May-08            | BMDL                  | BMDL                     |
| 30-Apr-08            | 2                     | 2                        |
| 31-Mar-08            | BMDL                  | BMDL                     |
| 29-Feb-08            | 1                     | 1                        |
| 31-Jan-08            | BMDL                  | BMDL                     |
| 31-Dec-07            | BMDL                  | BMDL                     |
| 30-Nov-07            | 10                    | 10                       |
| 31-Oct-07            | 3                     | 3                        |
| 30-Sep-07            | BMDL                  | BMDL                     |
| 31-Aug-07            | 114                   | 326                      |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

| MCDOWELL ELEM SCHOOL | KY0079421             | E. coli (colonies/100ml) |
|----------------------|-----------------------|--------------------------|
| Month                | Average Concentration | Maximum Concentration    |
| 31-Jul-07            | 23                    | 23                       |
| 30-Jun-07            | 1                     | 1                        |
| 31-May-07            | BMDL                  | BMDL                     |
| 30-Apr-07            | BMDL                  | BMDL                     |
| 31-Mar-07            | BMDL                  | BMDL                     |

| OSBORNE ELEM SCHOOL | KY0089435             | E. coli (colonies/100ml) |
|---------------------|-----------------------|--------------------------|
| Quarter Ending      | Average Concentration | Maximum Concentration    |
| 31-Dec-09           |                       |                          |
| 30-Sep-09           | 1                     | 1                        |
| 30-Jun-09           | 2                     | 2                        |
| 31-Mar-09           | 15                    | 15                       |
| 31-Dec-08           | 2                     | 2                        |
| 30-Sep-08           | 3                     | 3                        |
| 30-Jun-08           | BMDL                  | BMDL                     |
| 31-Mar-08           | 1                     | 1                        |
| 31-Dec-07           | 1                     | 1                        |
| 30-Sep-07           | 33                    | 33                       |
| 30-Jun-07           | 20                    | 20                       |
| 31-Mar-07           |                       |                          |

| SOUTH FLOYD HIGH SCHOOL | KY0093912             | E. coli (colonies/100ml) |
|-------------------------|-----------------------|--------------------------|
| Month                   | Average Concentration | Maximum Concentration    |
| 31-Jan-10               |                       |                          |
| 31-Dec-09               |                       |                          |
| 30-Nov-09               |                       |                          |
| 31-Oct-09               |                       |                          |
| 30-Sep-09               | BMDL                  | BMDL                     |
| 31-Aug-09               | 3                     | 3                        |
| 31-Jul-09               | BMDL                  | BMDL                     |
| 30-Jun-09               | BMDL                  | BMDL                     |
| 31-May-09               | BMDL                  | BMDL                     |
| 30-Apr-09               | 3                     | 3                        |
| 31-Mar-09               | 19                    | 372                      |
| 28-Feb-09               | 5                     | 5                        |
| 31-Jan-09               | 35                    | 201                      |
| 31-Dec-08               | 387                   | 2420                     |
| 30-Nov-08               | 14                    | 195                      |
| 31-Oct-08               | 1                     | 1                        |
| 30-Sep-08               | 24                    | 24                       |
| 31-Aug-08               | 15                    | 15                       |

Final

| SOUTH FLOYD HIGH SCHOOL | KY0093912             | E. coli (colonies/100ml) |
|-------------------------|-----------------------|--------------------------|
| Month                   | Average Concentration | Maximum Concentration    |
| 31-Jul-08               | 6                     | 6                        |
| 30-Jun-08               | BMDL                  | BMDL                     |
| 31-May-08               | 12                    | 12                       |
| 30-Apr-08               | 358                   | 2420                     |
| 31-Mar-08               | 49                    | < 2420                   |
| 29-Feb-08               | 49                    | > 2420                   |
| 31-Jan-08               | 103                   | 154                      |
| 31-Dec-07               | 74                    | 74                       |
| 30-Nov-07               | 51                    | 516                      |
| 31-Oct-07               | 18                    | 18                       |
| 30-Sep-07               | 18                    | 18                       |
| 31-Aug-07               | 6                     | 6                        |
| 31-Jul-07               | 12                    | 12                       |
| 30-Jun-07               | 1                     | 1                        |
| 31-May-07               | BMDL                  | BMDL                     |
| 30-Apr-07               | 98                    | > 2420                   |
| 31-Mar-07               | 120                   | > 2420                   |

| S & V MHP                            | KY0103233             | E. coli (colonies/100ml) |
|--------------------------------------|-----------------------|--------------------------|
| Quarter                              | Average Concentration | Maximum Concentration    |
| Oct-Dec 09                           | BMDL                  | BMDL                     |
| Jul -Sept 09                         | BMDL                  | BMDL                     |
| Apr-Jun 09                           | BMDL                  | BMDL                     |
| Jan-Mar 09                           | 49                    | > 2420                   |
| Oct-Dec 08                           | 214                   | 214                      |
| Jul-Sept 08                          | 99                    | 99                       |
| Apr-Jun 08                           | 4                     | 4                        |
| Jan- Mar 08                          | BMDL                  | BMDL                     |
| Oct-Dec 07                           | 1                     | 1                        |
| Jul-Sept 07                          | 2                     | 2                        |
| fecal coliform reporting begins here |                       |                          |
| Apr-Jun 07                           | BMDL                  | BMDL                     |
| Jan-Mar 07                           | BMDL                  | BMDL                     |

| LEFT BEAVER CREEK TOWNHOUSES | KY0096342             | E. coli (colonies/100ml) |
|------------------------------|-----------------------|--------------------------|
| Month                        | Average Concentration | Maximum Concentration    |
| 31-Dec-09                    |                       |                          |
| 30-Nov-09                    |                       |                          |
| 31-Oct-09                    |                       |                          |
| 30-Sep-09                    | 3                     | 3                        |
| 31-Aug-09                    | 50                    | 50                       |

Final
Beaver Creek Watershed E. coli TMDL

September, 2010

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|--|-------------------------|--------------------------|
| LEFT BEAVER CREEK TOWNHOUSES           | KY0096342               | E. coli (colonies/100ml) |
| Month                                  | Average Concentration   | Maximum Concentration    |
| 31-Jul-09                              | 20                      | 20                       |
| 30-Jun-09                              | 534                     | 2420                     |
| 31-May-09                              | 49                      | 49                       |
| 30-Apr-09                              | 27                      | 27                       |
| 31-Mar-09                              | 194                     | 1986                     |
| 28-Feb-09                              | BMDL                    | BMDL                     |
| 31-Jan-09                              | 115                     | 115                      |
| 31-Dec-08                              | 1414                    | 1414                     |
| 30-Nov-08                              | 30                      | 727                      |
| 31-Oct-08                              | 18                      | 18                       |
| 30-Sep-08                              | 31                      | 31                       |
| 31-Aug-08                              | 12                      | 12                       |
| 31-Jul-08                              | 190                     | 387                      |
| 30-Jun-08                              | BMDL                    | BMDL                     |
| 31-May-08                              | 332.5                   | 649                      |
| 30-Apr-08                              | 20                      | 20                       |
| 31-Mar-08                              | 127                     | 127                      |
| 29-Feb-08                              | 113                     | 113                      |
| 31-Jan-08                              | 43                      | 43                       |
| 31-Dec-07                              | 35                      | 35                       |
| 30-Nov-07                              | 19                      | 19                       |
| 31-Oct-07                              | 36                      | 36                       |
| 30-Sep-07                              | 31                      | 31                       |
| 31-Aug-07                              | 62                      | 150                      |
| 31-Jul-07                              | 674                     | 830                      |
| 30-Jun-07                              | 561                     | 575                      |
| 31-May-07                              | 54                      | 54                       |
| 30-Apr-07                              | 108                     | 613                      |
| 31-Mar-07                              | 17                      | 17                       |
| 28-Feb-07                              | 300                     | 579                      |
|  | n reporting begins here |                          |
| Jan-07                                 | 59                      | 59                       |
| •                                      | •                       |                          |

| WARCO HOUSING PROJECT | KY0072974             | E. coli (colonies/100ml) |
|-----------------------|-----------------------|--------------------------|
| Month                 | Average Concentration | Maximum Concentration    |
| 31-Jan-10             |                       |                          |
| 31-Dec-09             |                       |                          |
| 30-Nov-09             |                       |                          |
| 31-Oct-09             |                       |                          |
| 30-Sep-09             | BMDL                  | BMDL                     |
| 31-Aug-09             | BMDL                  | BMDL                     |
| 31-Jul-09             | 3                     | 3                        |
| 30-Jun-09             | 2                     | 2                        |

| WARCO HOUSING PROJECT | KY0072974             | E. coli (colonies/100ml) |
|-----------------------|-----------------------|--------------------------|
| Month                 | Average Concentration | Maximum Concentration    |
| 31-May-09             | 1                     | 1                        |
| 30-Apr-09             | BMDL                  | BMDL                     |
| 31-Mar-09             | BMDL                  | BMDL                     |
| 28-Feb-09             | BMDL                  | BMDL                     |
| 31-Jan-09             | 17                    | 17                       |
| 31-Dec-08             | 15                    | 15                       |
| 30-Nov-08             | 19                    | 378                      |
| 31-Oct-08             | 41                    | 41                       |
| 30-Sep-08             | 17                    | 17                       |
| 31-Aug-08             | 96                    | 96                       |
| 31-Jul-08             | 75                    | 921                      |
| 30-Jun-08             | 1218.5                | > 2420                   |
| 31-May-08             | 108                   | 108                      |
| 30-Apr-08             | 93                    | 185                      |
| 31-Mar-08             | 4                     | 4                        |
| 29-Feb-08             | 579                   | 579                      |
| 31-Jan-08             | 179                   | 179                      |
| 31-Dec-07             | BMDL                  | BMDL                     |
| 30-Nov-07             | 29                    | 29                       |
| 31-Oct-07             | 1                     | 1                        |
| 30-Sep-07             | 3                     | 3                        |
| 31-Aug-07             | BMDL                  | BMDL                     |
| 31-Jul-07             | BMDL                  | BMDL                     |
| 30-Jun-07             | 1                     | 1                        |
| 31-May-07             | 5                     | 5                        |
| 30-Apr-07             | 1                     | 1                        |
| 31-Mar-07             | BMDL                  | BMDL                     |
| 28-Feb-07             | BMDL                  | BMDL                     |
| 31-Jan-07             | BMDL                  | BMDL                     |

| MCDOWELL APPALACHIAN REG HOSP | KY0085791             | E. coli (colonies/100ml) |
|-------------------------------|-----------------------|--------------------------|
| Month                         | Average Concentration | Maximum Concentration    |
| 31-Dec-09                     |                       |                          |
| 30-Nov-09                     |                       |                          |
| 31-Oct-09                     |                       |                          |
| 30-Sep-09                     | 56.7                  | 56.7                     |
| 31-Aug-09                     | 68.3                  | 68.3                     |
| 31-Jul-09                     | <25                   | <25                      |
| 30-Jun-09                     | 51.7                  | 51.7                     |
| 31-May-09                     | 90                    | 90                       |
| 30-Apr-09                     | < 18                  | < 18                     |
| 31-Mar-09                     | 96.7                  | 96.7                     |

Final
Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL
September, 2010

| MCDOWELL APPALACHIAN REG HOSP | KY0085791             | E. coli (colonies/100ml) |
|-------------------------------|-----------------------|--------------------------|
| Month                         | Average Concentration | Maximum Concentration    |
| 28-Feb-09                     | 40                    | 40                       |
| 31-Jan-09                     | 82.2                  | 82.2                     |
| 31-Dec-08                     | 57.1                  | 57.1                     |
| 30-Nov-08                     | 28.3                  | 28.3                     |
| 31-Oct-08                     | 41.3                  | 41.3                     |
| 30-Sep-08                     | < 8.1                 | < 8.1                    |
| 31-Aug-08                     | < 26.3                | < 26.3                   |
| 31-Jul-08                     | 77.8                  | 77.8                     |
| 30-Jun-08                     | 34.9                  | 34.9                     |
| 31-May-08                     | 84.4                  | 84.4                     |
| 30-Apr-08                     | 58.7                  | 58.7                     |
| 31-Mar-08                     | 92.2                  | 92.2                     |
| 29-Feb-08                     | 117.8                 | 117.8                    |
| 31-Jan-08                     | 50.8                  | 50.8                     |
| 31-Dec-07                     | 117.8                 | 117.8                    |
| 30-Nov-07                     | 105.6                 | 105.6                    |
| 31-Oct-07                     | 83.3                  | 83.3                     |
| 30-Sep-07                     | 101.6                 | 101.6                    |
| 31-Aug-07                     | 65.1                  | 65.1                     |
| 31-Jul-07                     | 120.6                 | 120.6                    |
| 30-Jun-07                     | 144.4                 | 144.4                    |
| 31-May-07                     | 44.4                  | 44.4                     |
| 30-Apr-07                     | 4                     | 4                        |
| fecal coliform reporting begi | ns here               |                          |
| 31-Mar-07                     | 26                    | 26                       |
| 2/29/2007                     | 37                    | 37                       |
| 31-Jan-07                     | 36                    | 36                       |

| CONSOL OF KY INC JONES FORK | KY0094510             | Fecal coliform (colonies/100ml) |
|-----------------------------|-----------------------|---------------------------------|
| Month                       | Average Concentration | Maximum Concentration           |
| 31-Jan-10                   |                       |                                 |
| 31-Dec-09                   |                       |                                 |
| 30-Nov-09                   |                       |                                 |
| 31-Oct-09                   |                       |                                 |
| 30-Sep-09                   | no flow               |                                 |
| 31-Aug-09                   | no flow               |                                 |
| 31-Jul-09                   | no flow               |                                 |
| 30-Jun-09                   | <10                   | <10                             |
| 31-May-09                   | 80                    | 80                              |
| 30-Apr-09                   | <10                   | <10                             |
| 31-Mar-09                   | no flow               |                                 |

|                             |                       | Fecal coliform        |
|-----------------------------|-----------------------|-----------------------|
| CONSOL OF KY INC JONES FORK | KY0094510             | (colonies/100ml)      |
| Month                       | Average Concentration | Maximum Concentration |
| 28-Feb-09                   | 10                    | 10                    |
| 31-Jan-09                   | 10                    | 10                    |
| 31-Dec-08                   | < 10                  | < 10                  |
| 30-Nov-08                   | 10                    | 10                    |
| 31-Oct-08                   | < 10                  | < 10                  |
| 30-Sep-08                   | 60                    | 60                    |
| 31-Aug-08                   | 110                   | 110                   |
| 31-Jul-08                   | < 10                  | < 10                  |
| 30-Jun-08                   | 20                    | 20                    |
| 31-May-08                   | 20                    | 20                    |
| 30-Apr-08                   | 10                    | 10                    |
| 31-Mar-08                   | 20                    | 20                    |
| 29-Feb-08                   | < 10                  | < 10                  |
| 31-Jan-08                   | 30                    | 30                    |
| 31-Dec-07                   | 20                    | 20                    |
| 30-Nov-07                   | 10                    | 10                    |
| 31-Oct-07                   | 10                    | 10                    |
| 30-Sep-07                   |                       |                       |
| 31-Aug-07                   |                       |                       |
| 31-Jul-07                   |                       |                       |
| 30-Jun-07                   | 40                    | 40                    |
| 31-May-07                   | < 10                  | < 10                  |
| 30-Apr-07                   | 40                    | 40                    |
| 31-Mar-07                   | < 10                  | < 10                  |
| 28-Feb-07                   | 30                    | 30                    |
| 31-Jan-07                   | 10                    | 10                    |

| MCDOWELL DOLLAR GENERAL  |                       |                          |  |  |
|--------------------------|-----------------------|--------------------------|--|--|
| STORE                    | KY0103136             | E. coli (colonies/100ml) |  |  |
| Quarter Ending           | Average Concentration | Maximum Concentration    |  |  |
| 31-Dec-09                |                       |                          |  |  |
| 30-Sep-09                |                       |                          |  |  |
| 30-Jun-09                | ***                   | ***                      |  |  |
| 31-Mar-09                | C = NO DISCHARGE      |                          |  |  |
| 31-Dec-08                | C = NO DISCHARGE      |                          |  |  |
| 30-Sep-08                | C = NO DISCHARGE      |                          |  |  |
| 30-Jun-08                | C = NO DISCHARGE      |                          |  |  |
| Jan-Mar 08               | C = NO DISCHARGE      |                          |  |  |
| 31-Dec-07                | 8 = OTHER             |                          |  |  |
| fecal coliform reporting | begins here           |                          |  |  |
| Jul-Sept 07              | C = NO DISCHARGE      | _                        |  |  |
| Apr-Jun 07               | ***                   | ***                      |  |  |

Final

|                        | *************************************** | F 1: ( 1 : (100 1)       |  |
|------------------------|---|--------------------------|--|
| GOLDEN YEARS REST HOME | KY0083089                               | E. coli (colonies/100ml) |  |
| Month                  | Average Concentration                   | Maximum Concentration    |  |
| 31-Jan-10              |   |                          |  |
| 31-Dec-09              |   |                          |  |
| 30-Nov-09              |   |                          |  |
| 31-Oct-09              |   |                          |  |
| 30-Sep-09              | 13                                      | 13                       |  |
| 31-Aug-09              | 101                                     | 101                      |  |
| 31-Jul-09              | < 1                                     | < 1                      |  |
| 30-Jun-09              | 2                                       | 2                        |  |
| 31-May-09              | < 1                                     | < 1                      |  |
| 30-Apr-09              | < 1                                     | < 1                      |  |
| 31-Mar-09              | < 10                                    | < 10                     |  |
| 28-Feb-09              | 1300                                    | 1300                     |  |
| 31-Jan-09              | 380                                     | 380                      |  |
| 31-Dec-08              | < 10                                    | < 10                     |  |
| 30-Nov-08              | < 10                                    | < 10                     |  |
| 31-Oct-08              | 10                                      | 10                       |  |
| 30-Sep-08              | < 10                                    | < 10                     |  |
| 31-Aug-08              | < 10                                    | < 10                     |  |
| 31-Jul-08              | < 10                                    | < 10                     |  |
| 30-Jun-08              | 280                                     | 280                      |  |
| 31-May-08              | 10                                      | 10                       |  |
| 30-Apr-08              | < 10                                    | < 10                     |  |
| 31-Mar-08              | < 10                                    | < 10                     |  |
| 29-Feb-08              | 30                                      | 30                       |  |
| 31-Jan-08              | < 10                                    | < 10                     |  |
| 31-Dec-07              | 14000                                   | 14000                    |  |
| 30-Nov-07              | < 10                                    | < 10                     |  |
| 31-Oct-07              | < 10                                    | < 10                     |  |
| 30-Sep-07              | < 10                                    | < 10                     |  |
| 31-Aug-07              | < 10                                    | < 10                     |  |
| 31-Jul-07              | < 10                                    | < 10                     |  |
| 30-Jun-07              | < 10                                    | < 10                     |  |
| 31-May-07              | < 10                                    | < 10                     |  |
| <u> </u>               | < 10                                    | < 10                     |  |
| 30-Apr-07              | form reporting begins here              | < 10                     |  |
|                        | <del> </del>                            | × 10                     |  |
| 31-Mar-07              | < 10                                    | < 10                     |  |
| 2/29/2007              | < 10                                    | < 10                     |  |
| 31-Jan-07              | < 10                                    | < 10                     |  |

## Appendix D. Unit Area Load Information

Table D.1 2007 Unit Area Loadings (<u>E</u>. <u>coli</u> million colonies/day/acre)

|      | 1010 2:1 200; 0 mor n ou 20 uum 80 ( <u>2</u> : <u>0 m mm on 0 o o m os; uu</u> g; uu o o ) |       |      |      |       |      |       |      |      |      |      |      |       |       |
|------|---|-------|------|------|-------|------|-------|------|------|------|------|------|-------|-------|
| Site | 5/15  | 5/16  | 5/30 | 6/13 | 6/27  | 7/10 | 7/26  | 8/17 | 8/31 | 9/13 | 9/14 | 9/28 | 10/12 | 11/16 |
| 13   | 7.1   |       | 0.5  | 2.3  | 44.6  | 0.8  | 39.6  | 0.6  |      | 0.3  |      | 0.1  | 0.0   | 0.9   |
| 20   | 0.3   |       | 1.9  | 1.0  | 11.0  | 0.7  | 30.9  | 0.0  | 0.1  |      | 0.1  | 0.0  | 0.0   | 0.8   |
| 22   |   | 3.8   | 1.0  | 0.5  | 14.9  | 0.6  | 16.4  | 0.4  |      |      | 1.8  | 0.5  | 0.5   | 4.4   |
| 24   | 19.9  |       | 2.4  | 43.3 | 299.3 | 0.3  | 2.5   |      |      |      |      |      |       |       |
| 27   |   | 122.1 | 6.7  | 4.7  | 8.6   | 0.9  | 0.2   |      |      |      |      |      |       | 9.0   |
| 30   |   | 5.5   | 2.3  | 0.9  | 58.4  | 0.6  |       | 0.4  |      |      |      |      | 0.3   | 0.0   |
| 31   | 0.3   |       | 0.4  | 1.5  | 32.6  |      | 59.2  | 1.0  | 0.2  |      | 0.3  | 0.1  | 0.1   | 1.6   |
| 32   | 23.7  |       | 2.2  | 0.4  | 3.8   | 0.4  | 22.0  | 1.1  |      |      | 0.0  | 0.0  | 0.0   | 1.4   |
| 33   | 58.3  |       | 0.1  | 0.5  | 1.3   | 0.4  | 45.9  | 0.2  |      |      | 0.3  |      |       | 0.7   |
| 34   | 0.4   |       | 2.1  | 2.2  | 37.8  | 0.8  | 107.5 | 0.4  |      |      | 0.3  | 0.1  | 0.1   | 19.8  |
| 35   |   |       | 1.4  |      |       |      |       | 0.3  |      |      |      |      | 0.2   |       |

Table D.2 2008 Unit Area Loadings (<u>E</u>. <u>coli</u> million colonies/day/acre)

|      |       |        |      |      | -6- (= |         |       |       |       |       |       |       |
|------|-------|--------|------|------|--------|---------|-------|-------|-------|-------|-------|-------|
| Site | 5/16  | 5/30   | 6/13 | 6/27 | 7/11   | 7/31    | 8/8   | 8/22  | 9/12  | 9/20  | 10/17 | 10/24 |
| 1    | 25.6  | 7.4    | 6.7  | 1.2  | 12.9   | 853.4   | 11.0  | 0.2   | 0.7   | 0.4   | 0.5   | 0.4   |
| 2    | 5.7   | 0.1    | 0.3  | 0.6  | 4.5    | 1515.5  | 106.7 | 13.3  | 0.1   | 0.0   | 4.1   | 0.0   |
| 3    |       | 0.9    | 3.2  | 0.6  | 6.0    |         | 0.0   |       | 1.5   | 0.1   | 0.1   | 1.1   |
| 4    |       | 1.6    | 3.5  | 0.6  | 15.4   |         | 1.0   | 0.3   | 0.3   | 0.7   | 0.3   | 0.1   |
| 36   | 239.3 | 1476.0 |      |      | 19.6   |         | 105.0 | 18.8  | 1.1   | 5.2   | 3.3   | 338.5 |
| 37   | 101.0 | 3036.6 | 26.2 | 4.2  | 55.6   | 1805.9  | 7.8   | 1.5   | 29.2  | 344.0 | 11.5  | 0.8   |
| 38   | 8.3   | 81.4   | 8.7  | 25.0 | 3.0    | 287.4   | 4.0   | 0.8   | 33.8  | 4.5   | 2.5   | 0.2   |
| 39   | 1.5   | 1.5    | 5.3  | 1.4  | 1.7    | 4938.0  | 1.1   | 1.1   | 8.7   | 0.4   | 1.0   | 0.2   |
| 40   |       | 0.0    | 0.1  | 0.1  | 0.5    | 21026.9 | 3.3   | 0.1   | 1.5   | 0.0   | 0.1   | 0.0   |
| 41   |       | 10.3   | 0.4  | 0.9  |        | 9375.1  | 5.6   |       | 69.5  | 2.7   |       |       |
| 42   |       | 1.8    | 12.0 | 1.6  |        |         | 0.9   | 0.3   | 7.8   | 1.6   | 5.1   | 0.5   |
| 43   |       | 0.8    | 0.8  | 1.3  |        |         | 1.3   | 1.5   | 3.6   | 148.5 | 8.4   |       |
| 44   |       | 0.2    | 1.9  |      |        |         | 0.2   |       | 0.5   | 0.2   |       | 1.4   |
| 45   | 59.7  | 105.3  | 1.2  | 2.2  | 0.6    | 1482.3  | 1.8   | 1.1   | 54.4  | 1.1   | 22.7  | 1.3   |
| 46   | 10.7  | 31.9   | 1.1  | 0.4  | 0.7    | 2867.2  | 1.1   | 0.1   | 6.1   | 0.1   | 0.3   | 0.2   |
| 47   |       | 2.3    | 0.2  | 0.1  | 0.1    | 211.9   | 0.0   | 0.2   | 1.5   | 0.1   | 0.4   | 0.2   |
| 48   |       | 0.9    | 1.1  |      |        | 1.6     | 0.1   | 234.6 | 0.3   | 0.1   | 0.3   |       |
| 49   |       | 0.2    | 0.3  | 0.5  |        | 1202.1  | 0.4   | 0.0   |       | 0.1   | 0.2   | 0.3   |
| 50   |       |        |      |      | 2.6    |         | 0.7   | 0.0   | 185.0 | 0.3   | 0.3   | 0.0   |
| 51   | 119.6 | 639.1  | 46.9 | 25.2 |        | 22798.7 | 22.5  | 7.5   | 281.0 | 42.3  | 20.9  | 0.2   |
| 52   | 0.2   | 0.6    | 0.2  | 0.2  | 1.0    | 11249.6 | 0.1   | 0.0   | 0.6   | 0.1   | 0.2   | 0.1   |
| 30a  | 9.1   | 0.9    | 3.3  | 0.6  | 7.4    |         | 2.8   | 0.3   | 0.3   | 0.2   | 0.1   | 0.2   |

### Appendix E. TMDLs for Additional Sites

#### **Beaver Creek Site 3**

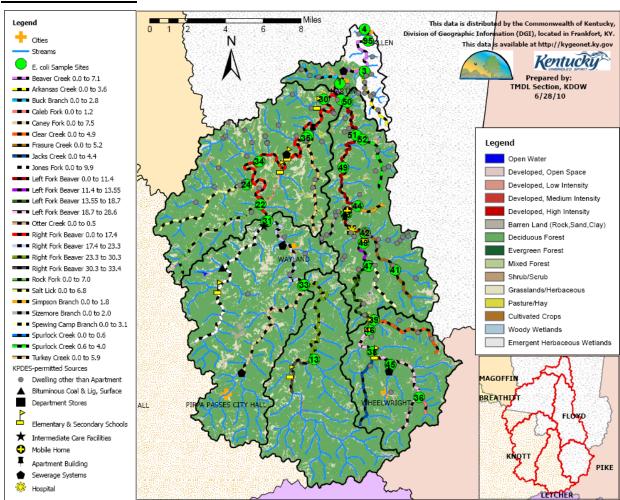


Figure E.1 Beaver Creek Site 3

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 2 is under site 3, site 30a is to the immediate left of site 50, site 27 is under site 35, site 20 is under site 31, site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Beaver Creek at site 3 (RM 3.9) is a fifth order stream located in the Mainstem Beaver Creek Subwatershed in Floyd County (Figure E.1). Information about Beaver Creek site 3, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.1. It has a catchment of 149,202 acres (233 square miles) with an 80% forested and 6.4 % developed land cover (Table E.2). Portions of this watershed are sewered; especially in larger cities (see Figures 5.13 through 5.19). There are five stream water withdrawals in this subwatershed (Table E.3). Sampling data from site 3 is presented in Table E.4, and the TMDL allocations in Table E.5.

Table E.1 Beaver Creek RM 0.0 to 7.1 Site 3 Information

| C4     | Stream  | WDID #    | Carrata  | <b>A</b>  | Square | C4            |         |         |          |
|--------|---------|-----------|----------|-----------|--------|---------------|---------|---------|----------|
| Stream | Segment | WBID#     | County   | Acres     | Miles  | Stream Order  |         |         |          |
|        | Beaver  |           |          |           |        |               |         |         |          |
|        | Creek   |           |          |           |        |               |         |         |          |
| Beaver | 0.0 to  |           |          |           |        |               |         |         |          |
| Creek  | 7.1     | 486610_01 | Floyd    | 149201.88 | 233.13 | 5th order     |         |         |          |
|        |         |           |          |           |        |               |         |         |          |
|        |         |           | Sample   | Sample    |        |               | + to    | - from  | Adjusted |
| EKU    | MAP     | Sample    | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #  | Point RM  | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs)   | (cfs)    |
| 3      | 3       | 3.9       | 37.57950 | -82.73200 | 309.8  | 3.9           | 1.19400 | 2.19242 | 308.8016 |

Table E.2 Beaver Creek Site 3 Subwatershed Land Cover

| Land Cover           | Watershed<br>Acres | Watershed<br>Square Miles | % of Total<br>Area | Future Growth WLA % |
|----------------------|--------------------|---------------------------|--------------------|---------------------|
| Open Water           | 89.18              | 0.14                      | 0.06               |                     |
| Developed            | 9530.28            | 14.89                     | 6.39               | 1                   |
| Barren Land          | 1703.77            | 2.66                      | 1.14               |                     |
| Forest Shrubland     | 118935.31          | 182.40                    | 79.71              |                     |
| Grassland/Herbaceous | 14272.84           | 22.30                     | 9.57               |                     |
| Pasture/ Hay         | 4365.16            | 6.82                      | 2.93               |                     |
| Cultivated Crops     | 284.44             | 0.44                      | 0.19               |                     |
| Wetlands             | 20.91              | 0.03                      | 0.01               |                     |
| Totals               | 149201.88          | 233.13                    | 100.00             |                     |

Table E.3 Beaver Creek Site 3 Water Withdrawals

| AI<br>number | Source Description | Withdrawal Facility<br>Name | Withdrawal (cfs) | Facility<br>Latitude | Facility<br>Longitude |
|--------------|--------------------|-----------------------------|------------------|----------------------|-----------------------|
|              | RM 40.6 Right      | ICG Knott Co LLC            |                  |                      |                       |
| 2528         | Fork Beaver Creek  | (860-8012)                  | 0.4100156        | 37.32166             | -82.80366             |
|              | RM 31.0 Right      | Deane Mining LLC            |                  |                      |                       |
| 2525         | Fork Beaver Creek  | (860-5318)                  | 0.01547229       | 37.41038             | -82.78096             |
|              | RM 15.36 of Left   | Elk Horn Coal Co            |                  |                      |                       |
| 1299         | Fork Beaver Creek  | LLC                         | 0.09283372       | 37.40129             | -82.74175             |
|              | RM 4.2 of Caney    |                             |                  |                      |                       |
| 3502         | Creek              | ICG Knott Co LLC            | 1.005699         | 37.3884              | -82.82856             |
|              | RM 2.4 of Left     | Black Diamond               |                  |                      |                       |
| 78571        | Fork Beaver Creek  | Mining                      | 0.6684028        | 37.53192             | -82.74364             |
|              |                    | subtraction from            |                  |                      |                       |
|              |                    | MAF (sum of cfs)            | 2.19242341       |                      |                       |

Table E.4 Beaver Creek Site 3 Data

| Table E.+ Beaver Creek |                        |            | Instantancous            |                                 |
|------------------------|------------------------|------------|--------------------------|---------------------------------|
|                        | г 1:                   |            | Instantaneous            | TT 'A T 1                       |
|                        | <u>E</u> . <u>coli</u> |            | Load (billion <u>E</u> . | Unit Area Load                  |
|                        | (colonies/100          |            | <u>coli</u>              | (million <u>E</u> . <u>coli</u> |
| Collection Date        | mls)                   | Flow (cfs) | colonies/day)            | colonies/day/acre)              |
| 05/16/08               | 1100                   | N/A        | N/A                      | N/A                             |
| 05/30/08               | 130                    | 43.987     | 139.90                   | 0.94                            |
| 06/13/08               | 430                    | 45.528     | 478.97                   | 3.21                            |
| 06/27/08               | 180                    | 18.869     | 83.10                    | 0.56                            |
| 07/11/08               | 610                    | 60.4       | 901.42                   | 6.04                            |
| 7/11/2008 (QA          |                        |            |                          |                                 |
| Sample)                | 550                    | N/A        | N/A                      | N/A                             |
| 07/31/08               | 4500                   | N/A        | N/A                      | N/A                             |
| 08/08/08               | 240                    | 0.0075     | 0.04                     | 0.00                            |
| 09/12/08               | 390                    | 23.475     | 223.99                   | 1.50                            |
| 09/20/08               | 90                     | 9.925      | 21.85                    | 0.15                            |
| 10/17/08               | 90                     | 9.692      | 21.34                    | 0.14                            |
| 10/24/08               | 750                    | 9.081      | 166.63                   | 1.12                            |
| Greatest Concentration | 4500                   |            |                          |                                 |

Table E.5 TMDLs for Beaver Creek Site 3

| Tuoie E.S | TIVIDESTOL | Deaver Creek Site | 5         |           |                  |             |
|-----------|------------|-------------------|-----------|-----------|------------------|-------------|
| TMDL      |            |                   |           |           | E. coli (billion |             |
| Table     |            |                   |           |           | colonies/day)    |             |
|           |            |                   |           |           | ,                | Existing    |
|           |            |                   |           |           | 33997.7911       | Load        |
|           |            |                   |           |           |                  | Total       |
|           |            |                   |           |           | 1813.2155        | TMDL        |
|           |            |                   |           |           | 181.3216         | MOS         |
|           |            |                   |           |           |                  | TMDL        |
|           |            |                   |           |           | 1631.8940        | Target      |
|           |            |                   |           | Design    |                  |             |
| AI        |            | Discharger        |           | Capacity  |                  |             |
| number    | KPDES#     | Facility Name     | Type      | (cfs)     | 95.20            | % reduction |
|           |            |                   | Sewerage  |           |                  | KPDES       |
| 1262      | KY0026921  | MARTIN STP        | System    | 0.1856675 | 1.0902           | WLA         |
|           |            | WHEELWRIGHT       | Sewerage  |           |                  | KPDES       |
| 40534     | KY0028789  | STP               | System    | 0.3481265 | 2.0441           | WLA         |
|           |            | KNOTT CO          |           |           |                  |             |
|           |            | WATER &           | Sewerage  |           |                  | KPDES       |
| 2527      | KY0042854  | SEWER DIST        | System    | 0.1547229 | 0.9085           | WLA         |
|           |            | WARCO             |           |           |                  |             |
|           |            | HOUSING           | Apartment |           |                  | KPDES       |
| 1352      | KY0072974  | PROJECT           | Building  | 0.0386807 | 0.2271           | WLA         |
|           |            | BEAVER            |           |           |                  |             |
|           |            | CREEK ELEM        |           |           |                  | KPDES       |
| 33945     | KY0077542  | SCHOOL            | School    | 0.0108306 | 0.0636           | WLA         |

|        |               |                        |                    | Design    |                  |                          |
|--------|---------------|------------------------|--------------------|-----------|------------------|--------------------------|
| AI     |               | Discharger             |                    | Capacity  | E. coli (billion |                          |
| number | KPDES#        | Facility Name          | Туре               | (cfs)     | colonies/day)    |                          |
|        |               | MCDOWELL               | <b>31</b>          |           | 3/               | KPDES                    |
| 35252  | KY0079421     | ELEM SCHOOL            | School             | 0.0232084 | 0.1363           | WLA                      |
|        |               | ALLEN                  |                    |           |                  |                          |
|        |               | CENTRAL HIGH           |                    |           |                  | KPDES                    |
| 35254  | KY0079430     | SCHOOL                 | School             | 0.0170195 | 0.0999           | WLA                      |
|        |               | GOLDEN                 |                    |           |                  |                          |
|        |               | YEARS REST             | Intermediate       |           |                  | KPDES                    |
| 2517   | KY0083089     | HOME                   | Care Facility      | 0.0154723 | 0.0908           | WLA                      |
|        |               | MCDOWELL               |                    |           |                  | LABBEG                   |
| 1124   | 17370005701   | APPALACHIAN            | TT '/ 1            | 0.0200446 | 0.1017           | KPDES                    |
| 1134   | KY0085791     | REG HOSP               | Hospital           | 0.0309446 | 0.1817           | WLA                      |
| 25250  | VV0007074     | JONES FORK             | School             | 0.0092834 | 0.0545           | KPDES                    |
| 35359  | KY0087076     | ELEM SCHOOL<br>OSBORNE | SCHOOL             | 0.0092834 | 0.0545           | WLA<br>KPDES             |
| 35251  | KY0089435     | ELEM SCHOOL            | School             | 0.0105212 | 0.0618           | WLA                      |
| 33231  | K10009433     | JAMES A DUFF           | SCHOOL             | 0.0103212 | 0.0016           | KPDES                    |
| 35258  | KY0093017     | ELEM SCHOOL            | School             | 0.0123778 | 0.0727           | WLA                      |
| 33230  | 11 00/301/    | SOUTH FLOYD            | School             | 0.0125770 | 0.0121           | KPDES                    |
| 35260  | KY0093912     | HIGH SCHOOL            | School             | 0.0232084 | 0.1363           | WLA                      |
| 55200  | 1110032312    | CONSOL OF KY           | Bituminous         | 0.0222001 | 011000           | ,, <u> </u>              |
|        |               | INC JONES              | Coal & Lig,        |           |                  | KPDES                    |
| 2514   | KY0094510     | FORK                   | Surface            | 0.0046417 | 0.0273           | WLA                      |
|        |               | LEFT BEAVER            |                    |           |                  |                          |
|        |               | CREEK                  | Apartment          |           |                  | KPDES                    |
| 1255   | KY0096342     | TOWNHOUSES             | Building           | 0.0278501 | 0.1635           | WLA                      |
|        |               | MCDOWELL               |                    |           |                  |                          |
|        |               | DOLLAR                 |                    |           |                  |                          |
|        |               | GENERAL                | Department         |           |                  | KPDES                    |
| 1263   | KY0103136     | STORE                  | Store              | 0.0007736 | 0.0045           | WLA                      |
|        |               |                        | Mobile Home        |           |                  | KPDES                    |
| 1305   | KY0103233     | S & V MHP              | Site               | 0.0153176 | 0.0899           | WLA                      |
| 25561  | 17170105000   | WALL AND CED           | Sewerage           | 0.1545000 | 0.000=           | KPDES                    |
| 35761  | KY0105228     | WAYLAND STP            | System             | 0.1547229 | 0.9085           | WLA                      |
| 92002  | WW010/755     | MAY VALLEY             | C -11              | 0.0002024 | 0.0545           | KPDES                    |
| 82092  | KY0106755     | ELEM SCHOOL            | School             | 0.0092834 | 0.0545           | WLA                      |
| 35260  | KY0107051     | EASTERN STP            | Sewerage<br>System | 0.0386807 | 0.2271           | KPDES<br>WLA             |
| 33200  | K1010/031     | EASIEKN SIP            | Dwelling           | 0.0380807 | U.44/1           | WLA                      |
|        |               | MITCHELL               | Other than         |           |                  | KPDES                    |
| 1269   | KYG400478     | RESIDENCE              | Apartment          | 0.0007736 | 0.0045           | WLA                      |
| 120)   | 111 3 700 170 | TESTDETTE              | Dwelling           | 0.0007750 | 0.0010           | , , <u>2</u> 2, <u>x</u> |
|        |               | BLACKBURN              | Other than         |           |                  | KPDES                    |
| 1143   | KYG400479     | RESIDENCE              | Apartment          | 0.0007736 | 0.0045           | WLA                      |
|        |               |                        | Dwelling           |           |                  |                          |
|        |               | DEROSSETT              | Other than         |           |                  | KPDES                    |
| 1180   | KYG400520     | RESIDENCE              | Apartment          | 0.0007736 | 0.0045           | WLA                      |
|        |               |                        | Dwelling           |           |                  |                          |
|        |               | HICKS                  | Other than         |           |                  | KPDES                    |
| 1218   | KYG400567     | RESIDENCE              | Apartment          | 0.0007736 | 0.0045           | WLA                      |
|        |               |                        | Dwelling           |           |                  |                          |
|        |               | WRIGHT                 | Other than         |           |                  | KPDES                    |
| 1367   | KYG400579     | RESIDENCE              | Apartment          | 0.0007736 | 0.0045           | WLA                      |

|        |             |               |                        | Design    |   |         |
|--------|-------------|---------------|------------------------|-----------|---|---------|
| AI     |             | Discharger    |                        | Capacity  | E. coli (billion                        |         |
| number | KPDES#      | Facility Name | Туре                   | (cfs)     | colonies/day)                           |         |
|        |             |               | Dwelling               |           |   |         |
|        |             | GOBLE         | Other than             |           |   | KPDES   |
| 1196   | KYG400590   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             |               | Dwelling               |           |   |         |
|        | ******      | STUMBO        | Other than             |           | 0.0045                                  | KPDES   |
| 1327   | KYG400601   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             | CDEEN         | Dwelling               |           |   | LADDEC  |
| 1100   | WWC400602   | GREEN         | Other than             | 0.0007726 | 0.0045                                  | KPDES   |
| 1199   | KYG400603   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             | MCKINNEY      | Dwelling<br>Other than |           |   | KPDES   |
| 1265   | KYG400612   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
| 1203   | K10400012   | RESIDENCE     | Dwelling               | 0.0007730 | 0.0045                                  | WLA     |
|        |             | DYE           | Other than             |           |   | KPDES   |
| 1182   | KYG400614   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
| 1102   | 11 0 700014 | RESIDENCE     | Dwelling               | 0.0007730 | 0.0013                                  | VV 12/1 |
|        |             | ALLEN         | Other than             |           |   | KPDES   |
| 1133   | KYG400642   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             |               | Dwelling               |           | *************************************** |         |
|        |             | CURRENT       | Other than             |           |   | KPDES   |
| 4250   | KYG400659   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             |               | Dwelling               |           |   |         |
|        |             | MITCHELL      | Other than             |           |   | KPDES   |
| 1270   | KYG400666   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             |               | Dwelling               |           |   |         |
|        |             | SHREWBERRY    | Other than             |           |   | KPDES   |
| 1315   | KYG400677   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             | 2 2.          | Dwelling               |           |   |         |
|        | ******      | CASTLE        | Other than             |           |   | KPDES   |
| 1162   | KYG400678   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             | CACE          | Dwelling               |           |   | LADDEC  |
| 1161   | WWC400602   | CASE          | Other than             | 0.0007726 | 0.0045                                  | KPDES   |
| 1161   | KYG400692   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             | MULLINS       | Dwelling<br>Other than |           |   | KPDES   |
| 1274   | KYG400714   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
| 12/4   | 121 0700/14 | RESIDENCE     | Dwelling               | 0.0007730 | 0.0043                                  | WLA     |
|        |             | YOUMANS       | Other than             |           |   | KPDES   |
| 1369   | KYG400724   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             |               | Dwelling               |           |   | ., 23.2 |
|        |             | HOOVER        | Other than             |           |   | KPDES   |
| 1222   | KYG400730   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             |               | Dwelling               |           |   |         |
|        |             | BINGHAM       | Other than             |           |   | KPDES   |
| 1237   | KYG400753   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             |               | Dwelling               |           |   |         |
|        |             | TURNER        | Other than             |           |   | KPDES   |
| 1343   | KYG400778   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |
|        |             | a. =          | Dwelling               |           |   |         |
|        | WW. 6.66-5- | CARRAWAY      | Other than             | 0.000==== | 6.004=                                  | KPDES   |
| 1158   | KYG400787   | RESIDENCE     | Apartment              | 0.0007736 | 0.0045                                  | WLA     |

|        |              |               |                        | Design    |                  |            |
|--------|--------------|---------------|------------------------|-----------|------------------|------------|
| AI     |              | Discharger    |                        | Capacity  | E. coli (billion |            |
| number | KPDES#       | Facility Name | Туре                   | (cfs)     | colonies/day)    |            |
|        |              |               | Dwelling               |           |                  |            |
|        | ,            | COOK          | Other than             |           |                  | KPDES      |
| 1173   | KYG400790    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              |               | Dwelling               |           |                  |            |
|        |              | JACOBS        | Other than             |           |                  | KPDES      |
| 1232   | KYG400806    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              | DEDINDIG      | Dwelling               |           |                  |            |
| 1202   | 1/1/0/400026 | PERKINS       | Other than             | 0.0007726 | 0.0045           | KPDES      |
| 1293   | KYG400836    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              | CHEDHEDD      | Dwelling               |           |                  | LADDEC     |
| 1314   | WWC400044    | SHEPHERD      | Other than             | 0.0007726 | 0.0045           | KPDES      |
| 1314   | KYG400844    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              | COLLINS       | Dwelling<br>Other than |           |                  | KPDES      |
| 1168   | KYG400854    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
| 1108   | K10400034    | RESIDENCE     | Dwelling               | 0.0007730 | 0.0043           | WLA        |
|        |              | KESTER        | Other than             |           |                  | KPDES      |
| 1243   | KYG400915    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
| 1243   | K10400713    | RESIDENCE     | Dwelling               | 0.0007730 | 0.0043           | WEAK       |
|        |              | HALL          | Other than             |           |                  | KPDES      |
| 1202   | KYG400969    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              |               | Dwelling               |           | 0,00010          | ,, <u></u> |
|        |              | MEADE         | Other than             |           |                  | KPDES      |
| 1266   | KYG400970    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              |               | Dwelling               |           |                  |            |
|        |              | MULLINS       | Other than             |           |                  | KPDES      |
| 1276   | KYG400975    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              |               | Dwelling               |           |                  |            |
|        |              | HOWELL        | Other than             |           |                  | KPDES      |
| 4356   | KYG401040    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              |               | Dwelling               |           |                  |            |
|        |              | MAY           | Other than             |           |                  | KPDES      |
| 4327   | KYG401073    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              | O LOTTE       | Dwelling               |           |                  | LABBER     |
| 4250   | VVC401112    | CASTLE        | Other than             | 0.0007736 | 0.0045           | KPDES      |
| 4350   | KYG401113    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              | FRASURE       | Dwelling<br>Other than |           |                  | KPDES      |
| 4344   | KYG401121    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           |            |
| 4344   | K10401121    | KESIDENCE     | Dwelling               | 0.0007730 | 0.0045           | WLA        |
|        |              | CRUM          | Other than             |           |                  | KPDES      |
| 4336   | KYG401125    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
| 7330   | 10701123     | RESIDENCE     | Dwelling               | 0.0007730 | U•UU13           | WEA        |
|        |              | JONES         | Other than             |           |                  | KPDES      |
| 4349   | KYG401133    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              |               | Dwelling               |           |                  |            |
|        |              | DYE           | Other than             |           |                  | KPDES      |
| 4333   | KYG401140    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |
|        |              |               | Dwelling               |           |                  |            |
|        |              | TACKETT       | Other than             |           |                  | KPDES      |
| 4332   | KYG401142    | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA        |

|        |               |               |                        | Design    |                  |        |
|--------|---------------|---------------|------------------------|-----------|------------------|--------|
| AI     |               | Discharger    |                        | Capacity  | E. coli (billion |        |
| number | KPDES#        | Facility Name | Туре                   | (cfs)     | colonies/day)    |        |
|        |               |               | Dwelling               |           |                  |        |
|        |               | BARTLEY       | Other than             |           |                  | KPDES  |
| 4405   | KYG401197     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
|        |               |               | Dwelling               |           |                  |        |
|        |               | SHEPPARD      | Other than             |           |                  | KPDES  |
| 12253  | KYG401218     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
|        |               | I AMIGON      | Dwelling               |           |                  |        |
| 15625  | 17370401071   | LAWSON        | Other than             | 0.0007726 | 0.0045           | KPDES  |
| 15635  | KYG401271     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
|        |               | WEDD          | Dwelling               |           |                  | LADDEC |
| 15655  | WWC401206     | WEBB          | Other than             | 0.0007726 | 0.0045           | KPDES  |
| 15655  | KYG401296     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
|        |               | EVERIDGE      | Dwelling<br>Other than |           |                  | KPDES  |
| 15807  | KYG401352     | RESIDENCE     |                        | 0.0007736 | 0.0045           | WLA    |
| 13807  | K10401332     | RESIDENCE     | Apartment Dwelling     | 0.0007730 | 0.0045           | WLA    |
|        |               | WILLIAMSON    | Other than             |           |                  | KPDES  |
| 33378  | KYG401353     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
| 33376  | K10401333     | RESIDENCE     | Dwelling               | 0.0007730 | 0.0043           | WLA    |
|        |               | WILLIAMSON    | Other than             |           |                  | KPDES  |
| 74022  | KYG401406     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
| , 1022 | 111 0 101 100 | TELETIFICE    | Dwelling               | 0.0007720 | 0.0016           | VV Zar |
|        |               | STUMBO        | Other than             |           |                  | KPDES  |
| 74025  | KYG401409     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
|        |               |               | Dwelling               |           |                  |        |
|        |               | MULLINS II    | Other than             |           |                  | KPDES  |
| 74062  | KYG401442     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
|        |               |               | Dwelling               |           |                  |        |
|        |               | TACKETT       | Other than             |           |                  | KPDES  |
| 74181  | KYG401470     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
|        |               |               | Dwelling               |           |                  |        |
|        |               | HALL          | Other than             |           |                  | KPDES  |
| 74185  | KYG401475     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
|        |               | 001           | Dwelling               |           |                  |        |
| 1170   | WWGASIS       | COLLINS       | Other than             | 0.0007736 | 0.0045           | KPDES  |
| 1168   | KYG401516     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
|        |               | MOORE         | Dwelling               |           |                  | LADDEC |
| 25007  | KYG401533     | MOORE         | Other than             | 0.0007736 | 0.0045           | KPDES  |
| 35887  | K 1 U401333   | RESIDENCE     | Apartment Dwelling     | 0.0007736 | 0.0045           | WLA    |
|        |               | WALLACE       | Other than             |           |                  | KPDES  |
| 43120  | KYG401540     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
| 73120  | K10401340     | RESIDENCE     | Dwelling               | 0.0007730 | 0.0043           | WLA    |
|        |               | PRATER        | Other than             |           |                  | KPDES  |
| 43224  | KYG401548     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
| .5221  | 121 3 1013 10 | TESTELLIGE    | Dwelling               | 0.0007750 | 3.0018           | 7, 221 |
|        |               | CAUDILL       | Other than             |           |                  | KPDES  |
| 44695  | KYG401580     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |
|        |               |               | Dwelling               |           |                  |        |
|        |               | DINGUS        | Other than             |           |                  | KPDES  |
| 45073  | KYG401582     | RESIDENCE     | Apartment              | 0.0007736 | 0.0045           | WLA    |

|        |               |                    |                        | Design     |                  |   |
|--------|---------------|--------------------|------------------------|------------|------------------|---|
| AI     |               | Discharger         |                        | Capacity   | E. coli (billion |   |
| number | KPDES#        | Facility Name      | Туре                   | (cfs)      | colonies/day)    |   |
|        |               | GD / D / D / D / D | Dwelling               |            |                  |   |
| 45206  | 1/3//0401/507 | GEARHEART          | Other than             | 0.0007736  | 0.0045           | KPDES   |
| 45396  | KYG401587     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               | TIATT              | Dwelling<br>Other than |            |                  | LIDDEC  |
| 45070  | VVC401500     | HALL<br>RESIDENCE  | Apartment              | 0.0007726  | 0.0045           | KPDES<br>WLA                                  |
| 43070  | KYG401590     | RESIDENCE          | Dwelling               | 0.0007736  | 0.0043           | WLA   |
|        |               | WILLIAMSON         | Other than             |            |                  | KPDES   |
| 46144  | KYG401601     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
| 40144  | K10401001     | RESIDENCE          | Dwelling               | 0.0007730  | 0.0043           | WLA   |
|        |               | CHILDERS           | Other than             |            |                  | KPDES   |
| 46147  | KYG401603     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               |                    | Dwelling               |            | 0,000,10         | ,,, <u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u> |
|        |               | LAFERTY            | Other than             |            |                  | KPDES   |
| 47022  | KYG401638     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               |                    | Dwelling               |            |                  |   |
|        |               | DUFF               | Other than             |            |                  | KPDES   |
| 48864  | KYG401645     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               |                    | Dwelling               |            |                  |   |
|        |               | COCHRAN            | Other than             |            |                  | KPDES   |
| 48897  | KYG401646     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               |                    | Dwelling               |            |                  |   |
|        |               | YORK               | Other than             |            |                  | KPDES   |
| 49354  | KYG401654     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               | DI ANICENIGIUS     | Dwelling               |            |                  |   |
| 50021  | 1/3//0401/02  | BLANKENSHIP        | Other than             | 0.0007736  | 0.0045           | KPDES   |
| 50021  | KYG401692     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               | SCOTT              | Dwelling<br>Other than |            |                  | KPDES   |
| 50627  | KYG401721     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
| 30027  | K10401/21     | RESIDENCE          | Dwelling               | 0.0007730  | 0.0043           | WLA   |
|        |               | KIDD               | Other than             |            |                  | KPDES   |
| 50950  | KYG401730     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
| 30730  | 121 3 701 730 | NICHOLAS           | Dwelling               | 0.0001130  | U-UU-U-          | VV 13/1                                       |
|        |               | ISON               | Other than             |            |                  | KPDES   |
| 54879  | KYG401772     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               |                    | Dwelling               |            |                  |   |
|        |               | NEWMAN             | Other than             |            |                  | KPDES   |
| 71436  | KYG401809     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               |                    | Dwelling               |            |                  |   |
|        |               | COMBS              | Other than             |            |                  | KPDES   |
| 74243  | KYG401821     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               |                    | Dwelling               |            |                  |   |
| 55444  | TTTTG (0105)  | LITTLE             | Other than             | 0.000==2.5 | 0.00.17          | KPDES   |
| 75141  | KYG401851     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               | HOWARD             | Dwelling               |            |                  | LADDEC  |
| 75556  | VVC401057     | HOWARD             | Other than             | 0.0007726  | 0.0045           | KPDES   |
| 75556  | KYG401857     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
|        |               | ROWE               | Dwelling<br>Other than |            |                  | KPDES   |
| 75746  | KYG401868     | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA   |
| 13/40  | K10401008     | RESIDENCE          | Apartificit            | 0.0007730  | 0.0043           | WLA   |

|        |                |                      |                         | Design    |                  |                                       |
|--------|----------------|----------------------|-------------------------|-----------|------------------|---------------------------------------|
| AI     | WDDEG //       | Discharger           | T                       | Capacity  | E. coli (billion |                                       |
| number | KPDES #        | Facility Name        | Туре                    | (cfs)     | colonies/day)    |                                       |
|        |                | DH ITED              | Dwelling                |           |                  | LIDDEC                                |
| 76078  | KYG401876      | BILITER<br>RESIDENCE | Other than<br>Apartment | 0.0007736 | 0.0045           | KPDES<br>WLA                          |
| 70078  | K1U401670      | RESIDENCE            | Dwelling                | 0.0007730 | 0.0045           | WLA                                   |
|        |                | HARVEL               | Other than              |           |                  | KPDES                                 |
| 79525  | KYG401931      | RESIDENCE            | Apartment               | 0.0007736 | 0.0045           | WLA                                   |
| 19323  | K10401931      | RESIDENCE            | Dwelling                | 0.0007730 | 0.0043           | WLA                                   |
|        |                | MARTIN               | Other than              |           |                  | KPDES                                 |
| 81193  | KYG401970      | RESIDENCE            | Apartment               | 0.0007736 | 0.0045           | WLA                                   |
| 01175  | 111 0 1013 7 0 | TELETIFICE           | Dwelling                | 0.0007720 | 0.0012           | , , , , , , , , , , , , , , , , , , , |
|        |                | SCARBERRY            | Other than              |           |                  | KPDES                                 |
| 81570  | KYG401981      | RESIDENCE            | Apartment               | 0.0007736 | 0.0045           | WLA                                   |
|        |                |                      | Dwelling                |           |                  |                                       |
|        |                | HOPKINS              | Other than              |           |                  | KPDES                                 |
| 82471  | KYG402002      | RESIDENCE            | Apartment               | 0.0007736 | 0.0045           | WLA                                   |
|        |                |                      | Dwelling                |           |                  |                                       |
|        |                | COOK                 | Other than              |           |                  | KPDES                                 |
| 84292  | KYG402025      | RESIDENCE            | Apartment               | 0.0007736 | 0.0045           | WLA                                   |
|        |                |                      | Dwelling                |           |                  |                                       |
|        |                | PRATER               | Other than              |           |                  | KPDES                                 |
| 97291  | KYG402063      | RESIDENCE            | Apartment               | 0.0007736 | 0.0045           | WLA                                   |
|        |                |                      | Dwelling                |           |                  |                                       |
|        |                | LITTLE               | Other than              |           |                  | KPDES                                 |
| 103052 | KYG402117      | RESIDENCE            | Apartment               | 0.0007736 | 0.0045           | WLA                                   |
|        |                |                      |                         |           |                  | Total                                 |
|        |                |                      |                         |           | 7.0100           | KPDES                                 |
|        |                |                      | Addition to             |           | 7.0109           | WLA                                   |
|        |                |                      | MAF (sum of             |           |                  |                                       |
|        |                |                      | cfs)                    | 1.1939966 | 1624.8831        | remainder                             |
|        |                |                      | ,                       |           |                  | Future                                |
|        |                |                      |                         |           |                  | Growth                                |
|        |                |                      |                         |           | 16.2488          | WLA                                   |
|        |                |                      |                         |           | 23.2597          | Total WLA                             |
|        |                |                      |                         |           | 1608.6343        | LA                                    |

### **Beaver Creek Site PRI095**

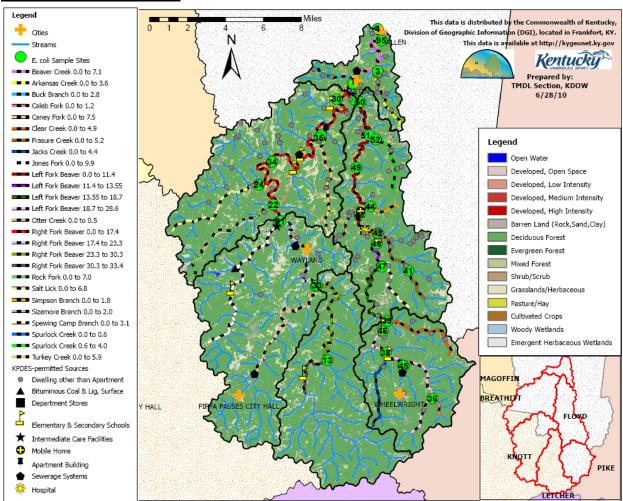


Figure E.2 Beaver Creek Site PRI095

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 2 is under site 3, site 30a is to the immediate left of site 50, site 27 is under site 35, site 20 is under site 31, site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Beaver Creek at site PRI095 (RM 1.1) is a fifth order stream located in the Mainstem Beaver Creek Subwatershed in Floyd County (Figure E.2). Information about Beaver Creek site PRI095, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.6. It has a catchment of 153,028 acres (239 square miles) with a 78% forested and 6.4% developed land cover (Table E.7). Portions of this watershed are sewered; especially in larger cities (see Figures 5.13 through 5.19). There are five stream water withdrawals in this subwatershed (Table E.8). Sampling data from site PRI095 is presented in Table E.9, and the TMDL allocations in Table E.10.

Table E.6 Beaver Creek Site PRI095 Information

|        | ~.      |           |          |           | ~      |               |       |        |         |
|--------|---------|-----------|----------|-----------|--------|---------------|-------|--------|---------|
|        | Stream  |           |          |           | Square |               |       |        |         |
| Stream | Segment | WBID#     | County   | Acres     | Miles  | Stream Order  |       |        |         |
|        | Beaver  |           |          |           |        |               |       |        |         |
|        | Creek   |           |          |           |        |               |       |        |         |
| Beaver | 0.0 to  |           |          | 153027.5  |        |               |       |        |         |
| Creek  | 7.1     | 486610_01 | Floyd    | 9         | 239.11 | 5th order     |       |        |         |
|        |         |           |          |           |        |               |       |        |         |
|        |         |           | Sample   | Sample    |        |               | + to  | - from | Adjuste |
|        | MAP     | Sample    | Site     | Site      | MAF    | RM of MAF     | MAF   | MAF    | d MAF   |
| Site # | Site #  | Point RM  | Latitude | Longitude | (cfs)  | Determination | (cfs) | (cfs)  | (cfs)   |
| PRI095 | 95      | 1.1       | 37.6028  | -82.7275  | 317    | 1.1           | 1.201 | 2.1924 | 316.009 |

Table E.7 Beaver Creek Site PRI095 Subwatershed Land Cover

| Land Cover           | Watershed<br>Acres | Watershed Square<br>Miles | % of Total Area | Future<br>Growth<br>WLA % |
|----------------------|--------------------|---------------------------|-----------------|---------------------------|
| Open Water           | 89.17              | 0.14                      | 0.06            | ,,, <u>21, 1, 0</u>       |
| Developed            | 9848.83            | 15.39                     | 6.44            | 1.0                       |
| Barren Land          | 1722.86            | 2.69                      | 1.13            |                           |
| Forest/Shrubland     | 119419.22          | 186.59                    | 78.04           |                           |
| Grassland/Herbaceous | 14689.87           | 22.95                     | 9.60            |                           |
| Pasture/Hay          | 4586.87            | 7.17                      | 3.00            |                           |
| Cultivated Crops     | 304.41             | 0.48                      | 0.20            |                           |
| Wetlands             | 22.01              | 0.03                      | 0.01            |                           |
| Totals               | 153027.60          | 239.11                    | 100.00          |                           |

Table E.8 Beaver Creek Site PRI095 Water Withdrawals

| AI<br>number | Source<br>Description | Withdrawal Facility<br>Name | Withdrawal, cfs | Facility<br>Latitude | Facility<br>Longitude |
|--------------|-----------------------|-----------------------------|-----------------|----------------------|-----------------------|
|              | RM 40.6 Right         |                             |                 |                      |                       |
|              | Fork Beaver           | ICG Knott Co LLC            |                 |                      |                       |
| 2528         | Creek                 | (860-8012)                  | 0.4100156       | 37.32166             | -82.80366             |
|              | RM 31.0 Right         |                             |                 |                      |                       |
|              | Fork Beaver           | Deane Mining LLC            |                 |                      |                       |
| 2525         | Creek                 | (860-5318)                  | 0.01547229      | 37.41038             | -82.78096             |
|              | RM 15.36 of Left      |                             |                 |                      |                       |
|              | Fork Beaver           | Elk Horn Coal Co            |                 |                      |                       |
| 1299         | Creek                 | LLC                         | 0.09283372      | 37.40129             | -82.74175             |
|              | RM 4.2 of Caney       |                             |                 |                      |                       |
| 3502         | Creek                 | ICG Knott Co LLC            | 1.005699        | 37.3884              | -82.82856             |
|              | RM 2.4 of Left        |                             |                 |                      |                       |
|              | Fork Beaver           | Black Diamond               |                 |                      |                       |
| 78571        | Creek                 | Mining                      | 0.6684028       | 37.53192             | -82.74364             |
|              |                       | subtraction from            |                 |                      |                       |
|              |                       | MAF (sum of cfs)            | 2.19242341      |                      |                       |

Table E.9 Beaver Creek Site PRI095 Data

|                        | E. coli       | 771   | Instantaneous Load              | Unit Area Load                  |
|------------------------|---------------|-------|---------------------------------|---------------------------------|
|                        | (colonies/100 | Flow  | (billion <u>E</u> . <u>coli</u> | (million <u>E</u> . <u>coli</u> |
| Collection Date        | mls)          | (cfs) | colonies/day)                   | colonies/day/acre)              |
| 5/17/07                | 2700          | N/A   | N/A                             | N/A                             |
| 6/14/07                | 656           | N/A   | N/A                             | N/A                             |
| 7/19/07                | 426           | N/A   | N/A                             | N/A                             |
| 8/14/07                | 500           | N/A   | N/A                             | N/A                             |
| 9/20/07                | 268           | N/A   | N/A                             | N/A                             |
| 10/18/07               | 261           | N/A   | N/A                             | N/A                             |
| 5/21/08                | 450           | N/A   | N/A                             | N/A                             |
| 6/17/08                | 19000         | N/A   | N/A                             | N/A                             |
| 7/16/08                | 220           | N/A   | N/A                             | N/A                             |
| 10/15/08               | 240           | N/A   | N/A                             | N/A                             |
| Greatest Concentration | 19000         |       |                                 |                                 |

Table E.10 TMDLs for Beaver Creek Site PRI095

| TMDL     | 0 11/12/2010 | Deaver Creek Bit    | 1111070       |                | E. coli (billion |             |
|----------|--------------|---------------------|---------------|----------------|------------------|-------------|
|          |              |                     |               |                |                  | 1           |
| Table    |              |                     |               |                | colonies/day)    |             |
|          |              |                     |               |                |                  | Existing    |
|          |              |                     |               |                | 146896.3813      | Load        |
|          |              |                     |               |                |                  | Total       |
|          |              |                     |               |                | 1855.5332        | TMDL        |
|          |              |                     |               |                | 185.5533         | MOS         |
|          |              |                     |               |                |                  | TMDL        |
|          |              |                     |               |                | 1669.9799        | Target      |
| AI       |              | Discharger Facility |               | Design         | 1009.9799        | 141801      |
| number   | KPDES#       | Name                | Туре          | Capacity (cfs) | 98.86            | % reduction |
| Hullioci | KI DES#      | TVallic             |               | Capacity (CIS) | 90.00            | KPDES       |
| 1262     | WW0026021    | MARTIN STP          | Sewerage      | 0.1856675      | 1 0002           |             |
| 1202     | KY0026921    |                     | System        | 0.1830073      | 1.0902           | WLA         |
|          |              | WHEELWRIGHT         | Sewerage      |                |                  | KPDES       |
| 40534    | KY0028789    | STP                 | System        | 0.3481265      | 2.0441           | WLA         |
|          |              | KNOTT CO            |               |                |                  |             |
|          |              | WATER &             | Sewerage      |                |                  | KPDES       |
| 2527     | KY0042854    | SEWER DIST          | System        | 0.1547229      | 0.9085           | WLA         |
|          |              | WARCO               |               |                |                  |             |
|          |              | HOUSING             | Apartment     |                |                  | KPDES       |
| 1352     | KY0072974    | PROJECT             | Building      | 0.0386807      | 0.2271           | WLA         |
| 1332     | 100/2///     | BEAVER CREEK        | Dunung        | 0.0300007      | 0,2271           | KPDES       |
| 33945    | KY0077542    | ELEM SCHOOL         | School        | 0.0108306      | 0.0636           | WLA         |
| 33943    | K10077342    |                     | School        | 0.0108300      | 0.0030           |             |
| 25252    | L/M0070401   | MCDOWELL            | G -11         | 0.0222004      | 0.1262           | KPDES       |
| 35252    | KY0079421    | ELEM SCHOOL         | School        | 0.0232084      | 0.1363           | WLA         |
|          |              | ALLEN               |               |                |                  |             |
|          |              | CENTRAL HIGH        |               |                |                  | KPDES       |
| 35254    | KY0079430    | SCHOOL              | School        | 0.0170195      | 0.0999           | WLA         |
|          |              | GOLDEN YEARS        | Intermediate  |                |                  | KPDES       |
| 2517     | KY0083089    | REST HOME           | Care Facility | 0.0154723      | 0.0908           | WLA         |
|          |              | MCDOWELL            |               |                |                  |             |
|          |              | APPALACHIAN         |               |                |                  | KPDES       |
| 1134     | KY0085791    | REG HOSP            | Hospital      | 0.0309446      | 0.1817           | WLA         |
| 1157     | 11 0003771   | ILLO 11001          | Hospital      | 0.0507440      | 0.1017           | WLA         |

| JONES FORK   LEM SCHOOL   School   0.0092834   0.0545   WLA  | AI     | KDDEC #     | Discharger Facility | Т         | Design         | E. coli (billion |       |
|--|--------|-------------|---------------------|-----------|----------------|------------------|-------|
| 35359  | number | KPDES #     | Name<br>IONES FORK  | Туре      | Capacity (cfs) | colonies/day)    | KPDFS |
| SSECRE   SCHOOL   School   0.0105212   0.0618   WIA  | 35359  | KY0087076   |                     | School    | 0.0092834      | 0.0545           |       |
| Sace    |        |             |                     |           |                |                  |       |
| 35258  | 35251  | KY0089435   |                     | School    | 0.0105212      | 0.0618           |       |
| South   School   School   0.023208438   0.1363   WILA  | 25259  | KV0003017   |                     | School    | 0.0122778      | 0.0727           |       |
| 35260  | 33236  | K10093017   |                     | SCHOOL    | 0.0123778      | 0.0727           |       |
| Severage  | 35260  | KY0093912   |                     | School    | 0.023208438    | 0.1363           |       |
| 2514   KY0094510   INC JONES FORK   Surface   0.0046417   0.0273   WLA   |        |             |                     |           |                |                  |       |
| LEFT BEAVER   CREEK   Apartment   TOWNHOUSES   Building   0.0278501   0.1635   WLA   |        |             |                     |           | 0.004644=      |                  |       |
| CREEK   Apartment   Double   | 2514   | KY0094510   |                     | Surface   | 0.0046417      | 0.0273           | WLA   |
| 1255   KY0096342   TOWNHOUSES   Building   0.0278501   0.1635   WLA  |        |             |                     | Anartment |                |                  | KPDFS |
| MCDOWELL DOLLAR GENERAL Store   0.0007736   0.0045   WLA   | 1255   | KY0096342   |                     |           | 0.0278501      | 0.1635           |       |
| Table  |        |             |                     |           |                |                  |       |
| 1263   |        |             |                     |           |                |                  |       |
| 1305   KY0103233   S & V MHP   | 10.00  | 17170102127 |                     |           | 0.0007726      | 0.004=           |       |
| 1305   | 1263   | KY0103136   | STORE               |           | 0.0007/36      | 0.0045           |       |
| Sewerage   System   0.1547229   0.9085   WLA   | 1305   | KY0103233   | S & V MHP           |           | 0.0153176      | 0.0899           |       |
| 35761  | 1505   | 10103233    | 5 & V WIII          |           | 0.0133170      | 0.0077           |       |
| School   Colored than   Colored th | 35761  | KY0105228   | WAYLAND STP         | _         | 0.1547229      | 0.9085           |       |
| Sewerage   System   0.038680729   0.2271   WLA   |        |             |                     |           |                |                  |       |
| System   Dwelling   Other than   Apartment   O.0007736   O.0045   WLA  | 82092  | KY0106755   | ELEM SCHOOL         |           | 0.0092834      | 0.0545           |       |
| ROWE   Dwelling   Other than   Apartment   0.0007736   0.0045   WLA  | 35260  | KV0107051   | EACTEDNICTD         |           | 0.038680720    | 0.2271           |       |
| ROWE   Apartment   D.0007736   D.0045   WLA  | 33200  | K1010/031   | EASTERN SIT         |           | 0.038080729    | 0.22/1           | WLA   |
| 1269   KYG400478   RESIDENCE   Apartment   0.0007736   0.0045   WLA  |        |             | ROWE                |           |                |                  | KPDES |
| 1269   KYG400478   RESIDENCE   Apartment   0.0007736   0.0045   WLA  | 1304   | KYG400339   | RESIDENCE           | Apartment | 0.0007736      | 0.0045           | WLA   |
| 1269   |        |             |                     |           |                |                  |       |
| Dwelling   | 1260   | VVC400470   |                     |           | 0.0007726      | 0.0045           |       |
| BLACKBURN   RESIDENCE   Apartment   0.0007736   0.0045   WLA   | 1269   | KYG4004/8   | RESIDENCE           |           | 0.0007736      | 0.0045           | WLA   |
| 1143   KYG400479   RESIDENCE   Apartment   0.0007736   0.0045   WLA  |        |             | BLACKBURN           |           |                |                  | KPDES |
| DEROSSETT   Other than   Apartment   0.0007736   0.0045   WLA  | 1143   | KYG400479   |                     |           | 0.0007736      | 0.0045           |       |
| 1180   |        |             |                     |           |                |                  |       |
| HICKS  | 1100   | WWG 400520  |                     |           | 0.0007736      | 0.0045           |       |
| HICKS   Other than   Apartment   0.0007736   0.0045   WLA  | 1180   | KYG400520   | KESIDENCE           |           | 0.000//36      | 0.0045           | WLA   |
| 1218   KYG400567   RESIDENCE   Apartment   0.0007736   0.0045   WLA  |        |             | HICKS               |           |                |                  | KPDES |
| Note   | 1218   | KYG400567   |                     |           | 0.0007736      | 0.0045           |       |
| 1367         KYG400579         RESIDENCE         Apartment         0.0007736         0.0045         WLA           Dwelling           1196         KYG400590         RESIDENCE         Apartment         0.0007736         0.0045         WLA           Dwelling           1248         KYG400593         RESIDENCE         Apartment         0.0007736         0.0045         WLA           Dwelling           0 Dwelling         0.0007736         0.0045         WLA   |        |             |                     | Dwelling  |                |                  |       |
| Dwelling   Other than   Apartment   0.0007736   0.0045   WLA   | 1277   | WWC 400570  |                     |           | 0.0007737      | 0.0045           |       |
| Column   | 1367   | KYG4005/9   | KESIDENCE           |           | 0.0007736      | 0.0045           | WLA   |
| 1196         KYG400590         RESIDENCE         Apartment         0.0007736         0.0045         WLA           Dwelling         Dwelling         Other than         KPDES           1248         KYG400593         RESIDENCE         Apartment         0.0007736         0.0045         WLA           Dwelling         Other than         KPDES         KPDES   |        |             | GOBLE               |           |                |                  | KPDES |
| LAWSON Other than Apartment O.0007736 O.0045 WLA  STUMBO Other than Dwelling Other than O.0007736 KPDES  KPDES WLA   | 1196   | KYG400590   |                     |           | 0.0007736      | 0.0045           |       |
| 1248         KYG400593         RESIDENCE         Apartment         0.0007736         0.0045         WLA           Dwelling<br>Other than         Other than         KPDES  |        |             |                     | Dwelling  |                |                  |       |
| STUMBO Dwelling Other than KPDES   | 10.40  | WWG 100 705 |                     |           | 0.000773       | 0.004-           |       |
| STUMBO Other than KPDES  | 1248   | KYG400593   | RESIDENCE           |           | 0.0007736      | 0.0045           | WLA   |
|  |        |             | STUMBO              |           |                |                  | KPDES |
|  | 1327   | KYG400601   | RESIDENCE           | Apartment | 0.0007736      | 0.0045           | WLA   |

| AI     |               | Discharger Facility |                         | Design         | E. coli (billion |              |
|--------|---------------|---------------------|-------------------------|----------------|------------------|--------------|
| number | KPDES#        | Name                | Type                    | Capacity (cfs) | colonies/day)    |              |
|        |               |                     | Dwelling                |                |                  |              |
|        |               | GREEN               | Other than              |                |                  | KPDES        |
| 1199   | KYG400603     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
|        |               |                     | Dwelling                |                |                  |              |
|        |               | MCKINNEY            | Other than              |                |                  | KPDES        |
| 1265   | KYG400612     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
|        |               |                     | Dwelling                |                |                  | LADDEC       |
| 1182   | KYG400614     | DYE RESIDENCE       | Other than              | 0.0007736      | 0.0045           | KPDES        |
| 1102   | K10400014     | DIE KESIDENCE       | Apartment Dwelling      | 0.0007736      | 0.0045           | WLA          |
|        |               | ALLEN               | Other than              |                |                  | KPDES        |
| 1133   | KYG400642     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
| 1133   | K10400042     | RESIDENCE           | Dwelling                | 0.0007730      | 0.0043           | WEAK         |
|        |               | CURRENT             | Other than              |                |                  | KPDES        |
| 4250   | KYG400659     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
|        |               |                     | Dwelling                |                |                  |              |
|        |               | MITCHELL            | Other than              |                |                  | KPDES        |
| 1270   | KYG400666     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
|        |               |                     | Dwelling                |                |                  |              |
|        |               | SHREWBERRY          | Other than              |                |                  | KPDES        |
| 1315   | KYG400677     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
|        |               |                     | Dwelling                |                |                  | -            |
| 11.0   | ###G 400 650  | CASTLE              | Other than              | 0.0007726      | 0.004-           | KPDES        |
| 1162   | KYG400678     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
|        |               | CACE                | Dwelling                |                |                  | LADDEC       |
| 1161   | KYG400692     | CASE<br>RESIDENCE   | Other than<br>Apartment | 0.0007736      | 0.0045           | KPDES<br>WLA |
| 1101   | K10400092     | RESIDENCE           | Dwelling                | 0.0007730      | 0.0045           | WLA          |
|        |               | MULLINS             | Other than              |                |                  | KPDES        |
| 1274   | KYG400714     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
| 1271   | 1210100711    | REGIBERGE           | Dwelling                | 0.0007730      | 0.0016           | ,, <u> </u>  |
|        |               | YOUMANS             | Other than              |                |                  | KPDES        |
| 1369   | KYG400724     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
|        |               |                     | Dwelling                |                |                  |              |
|        |               | HOOVER              | Other than              |                |                  | KPDES        |
| 1222   | KYG400730     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
|        |               |                     | Dwelling                |                |                  |              |
| 400=   | WW.G 405==1   | BINGHAM             | Other than              | 0.000=53.5     | 0.004=           | KPDES        |
| 1237   | KYG400753     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
|        |               | TUDNED              | Dwelling                |                |                  | IZBDEC       |
| 1242   | KYG400778     | TURNER              | Other than              | 0.0007726      | 0.0045           | KPDES        |
| 1343   | K1U400//8     | RESIDENCE           | Apartment Dwelling      | 0.0007736      | 0.0045           | WLA          |
|        |               | CARRAWAY            | Other than              |                |                  | KPDES        |
| 1158   | KYG400787     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
| 1130   | 111 0 100 101 | TESTDERICE          | Dwelling                | 0.0007750      | U-UUTJ           | VV 13/1 X    |
|        |               | COOK                | Other than              |                |                  | KPDES        |
| 1173   | KYG400790     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |
|        |               |                     | Dwelling                |                |                  |              |
|        |               | JACOBS              | Other than              |                |                  | KPDES        |
| 1232   | KYG400806     | RESIDENCE           | Apartment               | 0.0007736      | 0.0045           | WLA          |

|   | AI     |               | Discharger Facility  |                        | Design         | E. coli (billion |              |
|---|--------|---------------|----------------------|------------------------|----------------|------------------|--------------|
|   | number | KPDES#        | Name                 | Type                   | Capacity (cfs) | colonies/day)    |              |
|   |        |               |                      | Dwelling               |                |                  |              |
|   |        |               | PERKINS              | Other than             |                |                  | KPDES        |
|   | 1293   | KYG400836     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   |        |               |                      | Dwelling               |                |                  |              |
|   |        |               | SHEPHERD             | Other than             |                |                  | KPDES        |
|   | 1314   | KYG400844     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   |        |               |                      | Dwelling               |                |                  | -            |
|   | 4460   | ******        | COLLINS              | Other than             |                |                  | KPDES        |
|   | 1168   | KYG400854     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   |        |               | WE COMED             | Dwelling               |                |                  | LIBBER       |
|   | 10.40  | 17170 40001 5 | KESTER               | Other than             | 0.0007726      | 0.004=           | KPDES        |
|   | 1243   | KYG400915     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   |        |               | OTLID CILI           | Dwelling               |                |                  | LADDEC       |
|   | 1220   | IZVC 40002 C  | STURGILL             | Other than             | 0.0007736      | 0.0045           | KPDES        |
|   | 1328   | KYG400936     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   |        |               | TIATI                | Dwelling<br>Other them |                |                  | LADDEC       |
|   | 1202   | 1/3/C/1000/0  | HALL                 | Other than             | 0.0007726      | 0.0045           | KPDES        |
| _ | 1202   | KYG400969     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   |        |               | MEADE                | Dwelling               |                |                  | LIDDEC       |
|   | 1266   | VVC400070     | MEADE                | Other than             | 0.0007726      | 0.0045           | KPDES        |
|   | 1266   | KYG400970     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   |        |               | MILLING              | Dwelling<br>Other than |                |                  | LIDDEC       |
|   | 1276   | KYG400975     | MULLINS<br>RESIDENCE |                        | 0.0007736      | 0.0045           | KPDES<br>WLA |
| - | 1270   | K10400973     | RESIDENCE            | Apartment Dwelling     | 0.0007730      | 0.0043           | WLA          |
|   |        |               | HOWELL               | Other than             |                |                  | KPDES        |
|   | 4356   | KYG401040     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
| - | 7330   | K10401040     | RESIDENCE            | Dwelling               | 0.0007730      | 0.0043           | WLA          |
|   |        |               | MAY                  | Other than             |                |                  | KPDES        |
|   | 4327   | KYG401073     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   | 1327   | RIGIOIOIS     | RESIDENCE            | Dwelling               | 0.0007730      | 0.0045           | VVIII        |
|   |        |               | CASTLE               | Other than             |                |                  | KPDES        |
|   | 4350   | KYG401113     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
| f | .550   | 121 0 101113  | TELOID BITTOE        | Dwelling               | 0.0007750      | 0.0010           | ,, 1321      |
|   |        |               | FRASURE              | Other than             |                |                  | KPDES        |
|   | 4344   | KYG401121     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
| T |        |               |                      | Dwelling               |                |                  |              |
|   |        |               | CRUM                 | Other than             |                |                  | KPDES        |
|   | 4336   | KYG401125     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   |        |               |                      | Dwelling               |                |                  |              |
|   |        |               | ROSE                 | Other than             |                |                  | KPDES        |
|   | 4342   | KYG401126     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   |        |               |                      | Dwelling               |                |                  |              |
|   |        |               | JONES                | Other than             |                |                  | KPDES        |
|   | 4349   | KYG401133     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   |        |               |                      | Dwelling               |                |                  |              |
|   |        |               |                      | Other than             |                |                  | KPDES        |
|   | 4333   | KYG401140     | DYE RESIDENCE        | Apartment              | 0.0007736      | 0.0045           | WLA          |
|   |        |               |                      | Dwelling               |                |                  |              |
|   |        |               | TACKETT              | Other than             |                |                  | KPDES        |
|   | 4332   | KYG401142     | RESIDENCE            | Apartment              | 0.0007736      | 0.0045           | WLA          |

| AI<br>number | KPDES#    | Discharger Facility<br>Name | Туре                                | Design<br>Capacity (cfs) | E. coli (billion colonies/day) |              |
|--------------|-----------|-----------------------------|-------------------------------------|--------------------------|--------------------------------|--------------|
| 4331         | KYG401143 | COOLEY<br>RESIDENCE         | Dwelling<br>Other than<br>Apartment | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 4405         | KYG401197 | BARTLEY<br>RESIDENCE        | Dwelling<br>Other than<br>Apartment | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 12253        | KYG401218 | SHEPPARD<br>RESIDENCE       | Dwelling<br>Other than<br>Apartment | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 15635        | KYG401271 | LAWSON<br>RESIDENCE         | Dwelling<br>Other than<br>Apartment | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 15655        | KYG401296 | WEBB<br>RESIDENCE           | Other than Apartment                | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 15807        | KYG401352 | EVERIDGE<br>RESIDENCE       | Other than Apartment                | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 33378        | KYG401353 | WILLIAMSON<br>RESIDENCE     | Other than Apartment                | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 74022        | KYG401406 | WILLIAMSON<br>RESIDENCE     | Other than Apartment Dwelling       | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 74025        | KYG401409 | STUMBO<br>RESIDENCE         | Other than Apartment Dwelling       | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 74062        | KYG401442 | MULLINS II<br>RESIDENCE     | Other than Apartment Dwelling       | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 74181        | KYG401470 | TACKETT<br>RESIDENCE        | Other than Apartment Dwelling       | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 74185        | KYG401475 | HALL<br>RESIDENCE           | Other than Apartment Dwelling       | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 1168         | KYG401516 | COLLINS<br>RESIDENCE        | Other than Apartment Dwelling       | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 35892        | KYG401529 | KEATHLEY<br>RESIDENCE       | Other than Apartment Dwelling       | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 35887        | KYG401533 | MOORE<br>RESIDENCE          | Other than Apartment Dwelling       | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 43120        | KYG401540 | WALLACE<br>RESIDENCE        | Other than Apartment Dwelling       | 0.0007736                | 0.0045                         | KPDES<br>WLA |
| 43224        | KYG401548 | PRATER<br>RESIDENCE         | Other than Apartment                | 0.0007736                | 0.0045                         | KPDES<br>WLA |

| AI<br>number | KPDES#        | Discharger Facility<br>Name | Туре                    | Design<br>Capacity (cfs) | E. coli (billion colonies/day) |   |
|--------------|---------------|-----------------------------|-------------------------|--------------------------|--------------------------------|---|
| Humber       | KI DES #      | Ivanic                      | Dwelling                | Capacity (CIS)           | colonics/day)                  |   |
|              |               | CAUDILL                     | Other than              |                          |                                | KPDES                                   |
| 44695        | KYG401580     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
|              |               |                             | Dwelling                |                          |                                |   |
|              |               | DINGUS                      | Other than              |                          |                                | KPDES                                   |
| 45073        | KYG401582     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
|              |               |                             | Dwelling                |                          |                                |   |
| 45206        | 1/1/0/401507  | GEARHEART                   | Other than              | 0.0007726                | 0.004=                         | KPDES                                   |
| 45396        | KYG401587     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
|              |               | HALL                        | Dwelling<br>Other than  |                          |                                | KPDES                                   |
| 45070        | KYG401590     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
| 43070        | K10401370     | RESIDENCE                   | Dwelling                | 0.0007730                | 0.0043                         | WLA                                     |
|              |               | WILLIAMSON                  | Other than              |                          |                                | KPDES                                   |
| 46144        | KYG401601     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
|              |               |                             | Dwelling                |                          |                                |   |
|              |               | CHILDERS                    | Other than              |                          |                                | KPDES                                   |
| 46147        | KYG401603     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
|              |               |                             | Dwelling                |                          |                                |   |
| 45000        | TTT C 101 (20 | LAFERTY                     | Other than              | 0.000                    |                                | KPDES                                   |
| 47022        | KYG401638     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
|              |               | DUEE                        | Dwelling                |                          |                                | LIDDEC                                  |
| 48864        | KYG401645     | DUFF<br>RESIDENCE           | Other than<br>Apartment | 0.0007736                | 0.0045                         | KPDES<br>WLA                            |
| 40004        | K10401043     | RESIDENCE                   | Dwelling                | 0.0007730                | 0.0043                         | WLA                                     |
|              |               | COCHRAN                     | Other than              |                          |                                | KPDES                                   |
| 48897        | KYG401646     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
| 10057        | 1210101010    | TESTSETTES                  | Dwelling                | 0.0007720                | 0.0016                         | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
|              |               | YORK                        | Other than              |                          |                                | KPDES                                   |
| 49354        | KYG401654     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
|              |               |                             | Dwelling                |                          |                                |   |
|              |               | BLANKENSHIP                 | Other than              |                          |                                | KPDES                                   |
| 50021        | KYG401692     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
|              |               | GGGTT.                      | Dwelling                |                          |                                | LADDEC                                  |
| 50627        | VVC401701     | SCOTT<br>RESIDENCE          | Other than              | 0.0007726                | 0.0045                         | KPDES                                   |
| 30027        | KYG401721     | RESIDENCE                   | Apartment Dwelling      | 0.0007736                | 0.0045                         | WLA                                     |
|              |               | KIDD                        | Other than              |                          |                                | KPDES                                   |
| 50950        | KYG401730     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
| 22720        | 22.01,20      |                             | Dwelling                |                          |                                | , , 132 1                               |
|              |               | MCKINNEY JR                 | Other than              |                          |                                | KPDES                                   |
| 53921        | KYG401764     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
|              |               |                             | Dwelling                |                          |                                |   |
|              |               | ISON                        | Other than              |                          |                                | KPDES                                   |
| 54879        | KYG401772     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
|              |               | ATT-111/1 ( A A A T         | Dwelling                |                          |                                | LABBEC                                  |
| 71.426       | VVC401900     | NEWMAN                      | Other than              | 0.0007726                | 0.0045                         | KPDES                                   |
| 71436        | KYG401809     | RESIDENCE                   | Apartment Dwelling      | 0.0007736                | 0.0045                         | WLA                                     |
|              |               | COMBS                       | Other than              |                          |                                | KPDES                                   |
| 74243        | KYG401821     | RESIDENCE                   | Apartment               | 0.0007736                | 0.0045                         | WLA                                     |
|              |               |                             | 1                       | , , , , , , , ,          |                                |   |

| A.T.                                 |             | D' 1 E '1'               |                        | ъ.                       | D 11 (1 111)                   |   |
|--------------------------------------|-------------|--------------------------|------------------------|--------------------------|--------------------------------|---|
| AI<br>number                         | KPDES#      | Discharger Facility Name | Туре                   | Design<br>Capacity (cfs) | E. coli (billion colonies/day) |   |
| Humber                               | KI DES II   | rame                     | Dwelling               | Cupacity (CIS)           | coronies/day)                  |   |
|                                      |             | LITTLE                   | Other than             |                          |                                | KPDES                                   |
| 75141                                | KYG401851   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
|                                      |             |                          | Dwelling               |                          |                                |   |
| 55556                                |             | HOWARD                   | Other than             | 0.0007726                | 0.004=                         | KPDES                                   |
| 75556                                | KYG401857   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
|                                      |             | ROWE                     | Dwelling<br>Other than |                          |                                | KPDES                                   |
| 75746                                | KYG401868   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
| 707.10                               | 1210101000  | 11201221102              | Dwelling               | 0.0007720                | 0.0016                         | ,, <u>L</u>                             |
|                                      |             | BILITER                  | Other than             |                          |                                | KPDES                                   |
| 76078                                | KYG401876   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
|                                      |             |                          | Dwelling               |                          |                                |   |
| 7.6105                               | 17170401003 | ALLEN                    | Other than             | 0.0007726                | 0.0045                         | KPDES                                   |
| 76185                                | KYG401883   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
|                                      |             | HARVEL                   | Dwelling<br>Other than |                          |                                | KPDES                                   |
| 79525                                | KYG401931   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
| 13020                                | 1210101991  | 11201221102              | Dwelling               | 0.0007720                | 0.0016                         | *************************************** |
|                                      |             | BENTLEY                  | Other than             |                          |                                | KPDES                                   |
| 79842                                | KYG401936   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
|                                      |             |                          | Dwelling               |                          |                                |   |
| 01102                                |             | MARTIN                   | Other than             | 0.0007726                | 0.004=                         | KPDES                                   |
| 81193                                | KYG401970   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
|                                      |             | SCARBERRY                | Dwelling<br>Other than |                          |                                | KPDES                                   |
| 81570                                | KYG401981   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
| 01370                                | RIGIOIO     | RESIDENCE                | Dwelling               | 0.0007750                | 0.0043                         | VV E/I                                  |
|                                      |             | HOPKINS                  | Other than             |                          |                                | KPDES                                   |
| 82471                                | KYG402002   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
|                                      |             |                          | Dwelling               |                          |                                |   |
| 0.4202                               | 17370402025 | COOK                     | Other than             | 0.0007726                | 0.0045                         | KPDES                                   |
| 84292                                | KYG402025   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
|                                      |             | PRATER                   | Dwelling<br>Other than |                          |                                | KPDES                                   |
| 97291                                | KYG402063   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
| , <u>-</u> , <u>-</u> , <u>-</u> , - |             | 2                        | Dwelling               |                          |                                |   |
|                                      |             | LITTLE                   | Other than             |                          |                                | KPDES                                   |
| 103052                               | KYG402117   | RESIDENCE                | Apartment              | 0.0007736                | 0.0045                         | WLA                                     |
|                                      |             |                          |                        |                          |                                | Total                                   |
|                                      |             |                          |                        |                          | 7.0510                         | KPDES                                   |
|                                      |             |                          | Addition to            |                          | 7.0518                         | WLA                                     |
|                                      |             |                          | MAF (sum               |                          |                                |   |
|                                      |             |                          | of cfs)                | 1.2009592                | 1662.9281                      | remainder                               |
|                                      |             |                          |                        |                          |                                | Future                                  |
|                                      |             |                          |                        |                          |                                | Growth                                  |
|                                      |             |                          |                        |                          | 16.6293                        | WLA                                     |
|                                      |             |                          |                        |                          | 23.6811                        | Total WLA                               |
|                                      |             |                          |                        |                          | 1646.2989                      | LA                                      |

### **Beaver Creek Site 4**

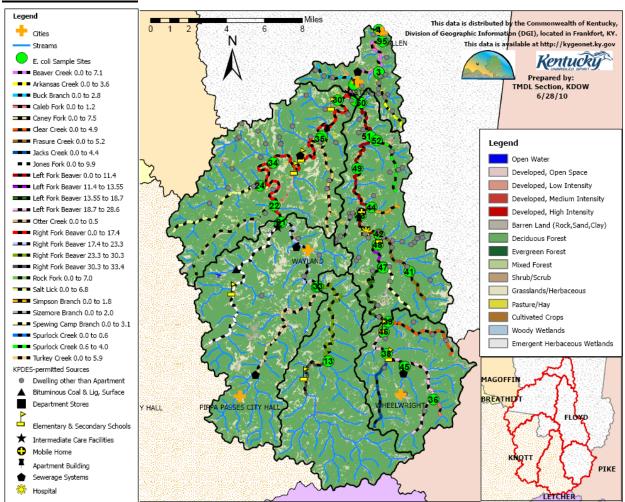


Figure E.3 Beaver Creek Site 4

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 2 is under site 3, site 30 is to the immediate left of site 50, site 27 is under site 35, site 20 is under site 31, site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Beaver Creek at site 4 (RM 0.2) is a fifth order stream located in the Mainstem Beaver Creek Subwatershed in Floyd County (Figure E.3). Information about Beaver Creek site 4, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.11. It has a catchment of 153,670 acres (240 square miles) with an 80% forested and 6.5 % developed land cover (Table E.12). Portions of this watershed are sewered; especially in larger cities (see Figures 5.13 through 5.19). There are five stream water withdrawals in this subwatershed (Table E.13). Sampling data from site PRI095 is presented in Table E.14, and the TMDL allocations in Table E.15.

Table E.11 Beaver Creek Site 4 Information

|        |                   |           |          |           |                 |               | i      |        |         |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|--------|--------|---------|
| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |        |        |         |
| 200000 | Beaver            |           |          |           |                 |               |        |        |         |
|        | Creek             |           |          |           |                 |               |        |        |         |
| Beaver | 0.0 to            |           |          |           |                 |               |        |        |         |
| Creek  | 7.1               | 486610_01 | Floyd    | 153669.8  | 240.11          | 5th order     |        |        |         |
|        |                   |           |          |           |                 |               |        |        |         |
|        |                   |           | Sample   | Sample    |                 |               | + to   | - from | Adjuste |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF    | MAF    | d MAF   |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)  | (cfs)  | (cfs)   |
| 4      | 4                 | 0.2       | 37.6118  | -82.7307  | 317.8           | 0             | 1.2025 | 2.1924 | 316.810 |

Table E.12 Beaver Creek Site 4 Subwatershed Land Cover

|                       |           |              | % of   |               |
|-----------------------|-----------|--------------|--------|---------------|
|                       | Watershed | Watershed    | Total  | Future Growth |
| Land Cover            | Acres     | Square Miles | Area   | WLA %         |
| Open Water            | 89.41     | 0.14         | 0.06   |               |
| Developed             | 9935.56   | 15.52        | 6.47   | 1.0           |
| Barren Land           | 1724.06   | 2.69         | 1.12   |               |
| Forest/Shrubland      | 122227.36 | 190.98       | 79.54  |               |
| Grassland/ Herbaceous | 14736.76  | 23.03        | 9.59   |               |
| Pasture/Hay           | 4628.17   | 7.23         | 3.01   |               |
| Cultivated Crops      | 305.80    | 0.48         | 0.20   |               |
| Wetlands              | 22.68     | 0.04         | 0.01   |               |
| Totals                | 153669.77 | 240.11       | 100.00 |               |

Table E.13 Beaver Creek Site 4 Water Withdrawals

| AI     |                     | Withdrawal Facility | Withdrawal | Facility | Facility  |
|--------|---------------------|---------------------|------------|----------|-----------|
| number | Source Description  | Name                | (cfs)      | Latitude | Longitude |
|        | RM 40.6 Right Fork  | ICG Knott Co LLC    |            |          |           |
| 2528   | Beaver Creek        | (860-8012)          | 0.4100156  | 37.32166 | -82.80366 |
|        | RM 31.0 Right Fork  | Deane Mining LLC    |            |          |           |
| 2525   | Beaver Creek        | (860-5318)          | 0.01547229 | 37.41038 | -82.78096 |
|        | RM 15.36 of Left    | Elk Horn Coal Co    |            |          |           |
| 1299   | Fork Beaver Creek   | LLC                 | 0.09283372 | 37.40129 | -82.74175 |
|        | RM 4.2 of Caney     |                     |            |          |           |
| 3502   | Creek               | ICG Knott Co LLC    | 1.005699   | 37.3884  | -82.82856 |
|        | RM 2.4 of Left Fork | Black Diamond       |            |          |           |
| 78571  | Beaver Creek        | Mining              | 0.6684028  | 37.53192 | -82.74364 |
|        |                     | subtraction from    |            |          |           |
|        |                     | MAF                 | 2.19242341 |          |           |

Table E.14 Beaver Creek Site 4 Data

|                        | <u>E</u> . <u>coli</u> | Flow   | Instantaneous Load (billion <u>E</u> . <u>coli</u> | Unit Area Load (million <u>E</u> . <u>coli</u> |
|------------------------|------------------------|--------|--|--|
| Collection Date        | (colonies/100 mls)     | (cfs)  | colonies/day)                                      | colonies/day/acre)                             |
| 05/16/08               | 300                    | N/A    | N/A  | N/A  |
| 05/30/08               | 290                    | 33.798 | 239.80   | 1.56   |
| 06/13/08               | 630                    | 34.654 | 534.14   | 3.48   |
| 06/27/08               | 180                    | 22.534 | 99.24  | 0.65   |
| 07/11/08               | 1500                   | 64.465 | 2365.78  | 15.40  |
| 07/31/08               | 1900                   | N/A    | N/A  | N/A  |
| 08/08/08               | 270                    | 23.691 | 156.50   | 1.02   |
| 08/22/08               | 250                    | 6.8769 | 42.06  | 0.27   |
| 09/12/08               | 90                     | 18.639 | 41.04  | 0.27   |
| 09/20/08               | 380                    | 11.850 | 110.17   | 0.72   |
| 9/20/08 (QA Sample)    | 190                    | N/A    | N/A  | N/A  |
| 10/17/08               | 210                    | 8.251  | 42.39  | 0.28   |
| 10/24/08               | 70                     | 11.35  | 19.44  | 0.13   |
| 10/24/08 (QA Sample)   | 70                     | N/A    | N/A  | N/A  |
| Greatest Concentration | 1900                   |        |  |  |

Table E.15 TMDLs for Beaver Creek Site 4

| TMDL   |           |                     |           |                | <u>E</u> . <u>coli</u><br>(billion |             |
|--------|-----------|---------------------|-----------|----------------|------------------------------------|-------------|
| Table  |           |                     |           |                | colonies/day)                      |             |
|        |           |                     |           |                |                                    | Existing    |
|        |           |                     |           |                | 14726.8980                         | Load        |
|        |           |                     |           |                |                                    | Total       |
|        |           |                     |           |                | 1860.2397                          | TMDL        |
|        |           |                     |           |                | 186.0240                           | MOS         |
|        |           |                     |           |                |                                    | TMDL        |
|        |           |                     |           |                | 1674.2158                          | Target      |
| AI     |           | Discharger Facility |           | Design         |                                    |             |
| number | KPDES#    | Name                | Туре      | Capacity (cfs) | 88.63                              | % reduction |
|        |           |                     | Sewerage  |                |                                    | KPDES       |
| 1262   | KY0026921 | MARTIN STP          | System    | 0.18566748     | 1.0902                             | WLA         |
|        |           | WHEELWRIGHT         | Sewerage  |                |                                    | KPDES       |
| 40534  | KY0028789 | STP                 | System    | 0.348126525    | 2.0441                             | WLA         |
|        |           | KNOTT CO            |           |                |                                    |             |
|        |           | WATER &             | Sewerage  |                |                                    | KPDES       |
| 2527   | KY0042854 | SEWER DIST          | System    | 0.1547229      | 0.9085                             | WLA         |
|        |           | WARCO               | Ž         |                |                                    |             |
|        |           | HOUSING             | Apartment |                |                                    | KPDES       |
| 1352   | KY0072974 | PROJECT             | Building  | 0.038680725    | 0.2271                             | WLA         |
|        |           | BEAVER CREEK        |           |                |                                    | KPDES       |
| 33945  | KY0077542 | ELEM SCHOOL         | School    | 0.010830603    | 0.0636                             | WLA         |
|        |           | MCDOWELL            |           |                |                                    | KPDES       |
| 35252  | KY0079421 | ELEM SCHOOL         | School    | 0.023208435    | 0.1363                             | WLA         |

| AI<br>number | KPDES#    | Discharger Facility<br>Name            | Туре                                 | Design<br>Capacity (cfs) | E. coli<br>(billion<br>colonies/day) |              |
|--------------|-----------|--|--------------------------------------|--------------------------|--------------------------------------|--------------|
| 35254        | KY0079430 | ALLEN<br>CENTRAL HIGH<br>SCHOOL        | School                               | 0.017019519              | 0.0999                               | KPDES<br>WLA |
| 2517         | KY0083089 | GOLDEN YEARS<br>REST HOME              | Intermediate<br>Care Facility        | 0.01547229               | 0.0908                               | KPDES<br>WLA |
| 1134         | KY0085791 | MCDOWELL<br>APPALACHIAN<br>REG HOSP    | Hospital                             | 0.03094458               | 0.1817                               | KPDES<br>WLA |
| 35359        | KY0087076 | JONES FORK<br>ELEM SCHOOL              | School                               | 0.009283374              | 0.0545                               | KPDES<br>WLA |
| 35251        | KY0089435 | OSBORNE ELEM<br>SCHOOL                 | School                               | 0.010521157              | 0.0618                               | KPDES<br>WLA |
| 35258        | KY0093017 | JAMES A DUFF<br>ELEM SCHOOL            | School                               | 0.012377832              | 0.0727                               | KPDES<br>WLA |
| 35260        | KY0093912 | SOUTH FLOYD<br>HIGH SCHOOL             | School                               | 0.023208438              | 0.1363                               | KPDES<br>WLA |
| 2514         | KY0094510 | CONSOL OF KY<br>INC JONES FORK         | Bituminous<br>Coal & Lig,<br>Surface | 0.004641686              | 0.0273                               | KPDES<br>WLA |
| 1255         | KY0096342 | LEFT BEAVER<br>CREEK<br>TOWNHOUSES     | Apartment<br>Building                | 0.027850122              | 0.1635                               | KPDES<br>WLA |
| 1263         | KY0103136 | MCDOWELL<br>DOLLAR<br>GENERAL<br>STORE | Department<br>Store                  | 0.000773615              | 0.0045                               | KPDES<br>WLA |
| 1305         | KY0103233 | S & V MHP                              | Mobile<br>Home Site                  | 0.015317567              | 0.0899                               | KPDES<br>WLA |
| 35761        | KY0105228 | WAYLAND STP                            | Sewerage<br>System                   | 0.1547229                | 0.9085                               | KPDES<br>WLA |
| 82092        | KY0106755 | MAY VALLEY<br>ELEM SCHOOL              | School                               | 0.009283375              | 0.0545                               | KPDES<br>WLA |
| 35260        | KY0107051 | EASTERN STP                            | Sewerage<br>System                   | 0.038680729              | 0.2271                               | KPDES<br>WLA |
| 1304         | KYG400339 | ROWE<br>RESIDENCE                      | Dwelling<br>Other than<br>Apartment  | 0.000773615              | 0.0045                               | KPDES<br>WLA |
| 1269         | KYG400478 | MITCHELL<br>RESIDENCE                  | Dwelling<br>Other than<br>Apartment  | 0.000773615              | 0.0045                               | KPDES<br>WLA |
| 1143         | KYG400479 | BLACKBURN<br>RESIDENCE                 | Dwelling<br>Other than<br>Apartment  | 0.000773615              | 0.0045                               | KPDES<br>WLA |
| 1180         | KYG400520 | DEROSSETT<br>RESIDENCE                 | Dwelling<br>Other than<br>Apartment  | 0.000773615              | 0.0045                               | KPDES<br>WLA |
| 1218         | KYG400567 | HICKS<br>RESIDENCE                     | Dwelling<br>Other than<br>Apartment  | 0.000773615              | 0.0045                               | KPDES<br>WLA |
| 1367         | KYG400579 | WRIGHT<br>RESIDENCE                    | Dwelling<br>Other than<br>Apartment  | 0.000773615              | 0.0045                               | KPDES<br>WLA |

|        |               |                      |                        |                | <u>E</u> . <u>coli</u> |          |
|--------|---------------|----------------------|------------------------|----------------|------------------------|----------|
| AI     |               | Discharger Facility  |                        | Design         | (billion               |          |
| number | KPDES#        | Name                 | Туре                   | Capacity (cfs) | colonies/day)          |          |
|        |               |                      | Dwelling               |                |                        |          |
|        |               | GOBLE                | Other than             |                |                        | KPDES    |
| 1196   | KYG400590     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               |                      | Dwelling               |                |                        |          |
|        |               | LAWSON               | Other than             |                |                        | KPDES    |
| 1248   | KYG400593     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               |                      | Dwelling               |                |                        |          |
|        |               | STUMBO               | Other than             |                |                        | KPDES    |
| 1327   | KYG400601     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               |                      | Dwelling               |                |                        |          |
|        |               | GREEN                | Other than             |                |                        | KPDES    |
| 1199   | KYG400603     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               |                      | Dwelling               |                |                        |          |
|        |               | MCKINNEY             | Other than             |                |                        | KPDES    |
| 1265   | KYG400612     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               |                      | Dwelling               |                |                        |          |
|        |               |                      | Other than             |                |                        | KPDES    |
| 1182   | KYG400614     | DYE RESIDENCE        | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               |                      | Dwelling               |                |                        |          |
|        |               | ALLEN                | Other than             |                |                        | KPDES    |
| 1133   | KYG400642     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               |                      | Dwelling               |                |                        |          |
|        |               | CURRENT              | Other than             |                |                        | KPDES    |
| 4250   | KYG400659     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               |                      | Dwelling               |                |                        |          |
|        |               | MITCHELL             | Other than             |                |                        | KPDES    |
| 1270   | KYG400666     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               |                      | Dwelling               |                |                        |          |
|        |               | SHREWBERRY           | Other than             |                |                        | KPDES    |
| 1315   | KYG400677     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               |                      | Dwelling               |                |                        |          |
| 11.5   | ******        | CASTLE               | Other than             |                | 0.0045                 | KPDES    |
| 1162   | KYG400678     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               | CACE                 | Dwelling               |                |                        | I/DE TO  |
| 1171   | WWC 400 (02   | CASE                 | Other than             | 0.000773615    | 0.0045                 | KPDES    |
| 1161   | KYG400692     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        |               | MILLING              | Dwelling               |                |                        | LIDDEC   |
| 1274   | KYG400714     | MULLINS<br>RESIDENCE | Other than             | 0.000773615    | 0.0045                 | KPDES    |
| 12/4   | K10400/14     | RESIDENCE            | Apartment              | 0.000773013    | 0.0045                 | WLA      |
|        |               | YOUMANS              | Dwelling<br>Other than |                |                        | KPDES    |
| 1369   | KYG400724     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
| 1309   | K10400724     | RESIDENCE            | Dwelling               | 0.000773013    | 0.0043                 | WLA      |
|        |               | HOOVER               | Other than             |                |                        | KPDES    |
| 1222   | KYG400730     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
| 1222   | 11 0 400 / 50 | KESIDENCE            | Dwelling               | 0.000773013    | 0.0013                 | WEA      |
|        |               | BINGHAM              | Other than             |                |                        | KPDES    |
| 1237   | KYG400753     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
| 1231   | 111 3 100703  | TESTEE THE           | Dwelling               | 0.000773013    | 0.0010                 | VV EJI K |
|        |               | TURNER               | Other than             |                |                        | KPDES    |
| 1343   | KYG400778     | RESIDENCE            | Apartment              | 0.000773615    | 0.0045                 | WLA      |
|        | 0.00,,0       | J, U.                |                        |                |                        |          |

|        |               |                     |                        |   | E. coli       |   |
|--------|---------------|---------------------|------------------------|---|---------------|---|
| AI     |               | Discharger Facility |                        | Design                                  | (billion      |   |
| number | KPDES#        | Name                | Туре                   | Capacity (cfs)                          | colonies/day) |   |
|        |               |                     | Dwelling               |   |               |   |
|        |               | CARRAWAY            | Other than             |   |               | KPDES                                   |
| 1158   | KYG400787     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               |                     | Dwelling               |   |               |   |
|        |               | COOK                | Other than             |   |               | KPDES                                   |
| 1173   | KYG400790     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               | T. GODG             | Dwelling               |   |               |   |
| 1000   | 1/1/0/40000   | JACOBS              | Other than             | 0.000773615                             | 0.0045        | KPDES                                   |
| 1232   | KYG400806     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               | DEDIVING            | Dwelling               |   |               | LADDEC                                  |
| 1293   | WWC400026     | PERKINS             | Other than             | 0.000772615                             | 0.0045        | KPDES                                   |
| 1293   | KYG400836     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               | SHEPHERD            | Dwelling<br>Other than |   |               | KPDES                                   |
| 1314   | KYG400844     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
| 1314   | K10400644     | RESIDENCE           | Dwelling               | 0.000773013                             | 0.0043        | WLA                                     |
|        |               | COLLINS             | Other than             |   |               | KPDES                                   |
| 1168   | KYG400854     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
| 1100   | 111 3 10005-1 | RESIDENCE           | Dwelling               | 0.000773013                             | 0.0043        | 44 E3E K                                |
|        |               | KESTER              | Other than             |   |               | KPDES                                   |
| 1243   | KYG400915     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               |                     | Dwelling               |   | 0,0010        | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
|        |               | STURGILL            | Other than             |   |               | KPDES                                   |
| 1328   | KYG400936     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               |                     | Dwelling               |   |               |   |
|        |               | HALL                | Other than             |   |               | KPDES                                   |
| 1202   | KYG400969     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               |                     | Dwelling               |   |               |   |
|        |               | MEADE               | Other than             |   |               | KPDES                                   |
| 1266   | KYG400970     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               |                     | Dwelling               |   |               |   |
|        |               | MULLINS             | Other than             |   |               | KPDES                                   |
| 1276   | KYG400975     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               | HOWER               | Dwelling               |   |               |   |
| 1256   | IZXC401040    | HOWELL              | Other than             | 0.000773615                             | 0.0047        | KPDES                                   |
| 4356   | KYG401040     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               | MAX                 | Dwelling<br>Other than |   |               | KDDEC                                   |
| 4327   | KYG401073     | MAY<br>RESIDENCE    | Apartment              | 0.000773615                             | 0.0045        | KPDES<br>WLA                            |
| 4321   | K104010/3     | RESIDENCE           | Dwelling               | 0.000773013                             | 0.0045        | WLA                                     |
|        |               | CASTLE              | Other than             |   |               | KPDES                                   |
| 4350   | KYG401113     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
| 7330   | ICI G-01113   | KESIDENCE           | Dwelling               | 0.000773013                             | 0.0013        | WEA                                     |
|        |               | FRASURE             | Other than             |   |               | KPDES                                   |
| 4344   | KYG401121     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               | 222222102           | Dwelling               | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | 0.0010        | , , 23, 2                               |
|        |               | CRUM                | Other than             |   |               | KPDES                                   |
| 4336   | KYG401125     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |
|        |               |                     | Dwelling               |   |               |   |
|        |               | ROSE                | Other than             |   |               | KPDES                                   |
| 4342   | KYG401126     | RESIDENCE           | Apartment              | 0.000773615                             | 0.0045        | WLA                                     |

|        |                |                     |                        |                | <u>E</u> . <u>coli</u> |        |
|--------|----------------|---------------------|------------------------|----------------|------------------------|--------|
| AI     |                | Discharger Facility |                        | Design         | (billion               |        |
| number | KPDES#         | Name                | Туре                   | Capacity (cfs) | colonies/day)          |        |
|        |                |                     | Dwelling               |                |                        |        |
| 12.10  | *****          | JONES               | Other than             |                |                        | KPDES  |
| 4349   | KYG401133      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
|        |                |                     | Dwelling               |                |                        |        |
| 4222   | 1777 0 4011 40 | DATE DEGIDENCE      | Other than             | 0.000773615    | 0.0045                 | KPDES  |
| 4333   | KYG401140      | DYE RESIDENCE       | Apartment              | 0.000773615    | 0.0045                 | WLA    |
|        |                | TACKETT             | Dwelling               |                |                        | LIDDEC |
| 4222   | VVC401142      | TACKETT             | Other than             | 0.000772615    | 0.0045                 | KPDES  |
| 4332   | KYG401142      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
|        |                | COOLEY              | Dwelling<br>Other than |                |                        | KPDES  |
| 4331   | KYG401143      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
| 4331   | K10401143      | RESIDENCE           | Dwelling               | 0.000773013    | 0.0043                 | WLA    |
|        |                | BARTLEY             | Other than             |                |                        | KPDES  |
| 4405   | KYG401197      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
| 1103   | KT GTUIT7/     | RESIDENCE           | Dwelling               | 0.000773013    | 0.0073                 | VILA   |
|        |                | SHEPPARD            | Other than             |                |                        | KPDES  |
| 12253  | KYG401218      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
| -2233  | 3.01210        |                     | Dwelling               | 2.2.2.07,73013 | 5,00.10                |        |
|        |                | LAWSON              | Other than             |                |                        | KPDES  |
| 15635  | KYG401271      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
|        |                |                     | Dwelling               |                |                        |        |
|        |                | WEBB                | Other than             |                |                        | KPDES  |
| 15655  | KYG401296      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
|        |                |                     | Dwelling               |                |                        |        |
|        |                | EVERIDGE            | Other than             |                |                        | KPDES  |
| 15807  | KYG401352      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
|        |                |                     | Dwelling               |                |                        |        |
|        |                | WILLIAMSON          | Other than             |                |                        | KPDES  |
| 33378  | KYG401353      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
|        |                |                     | Dwelling               |                |                        |        |
| 7.4000 | TAYO 101 105   | WILLIAMSON          | Other than             | 0.000550515    | 0.0045                 | KPDES  |
| 74022  | KYG401406      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
|        |                | OTLD (DO            | Dwelling               |                |                        | LADDEC |
| 74025  | VVC401400      | STUMBO              | Other than             | 0.000772615    | 0.0045                 | KPDES  |
| 74025  | KYG401409      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
|        |                | MULLINS II          | Dwelling<br>Other than |                |                        | KPDES  |
| 74062  | KYG401442      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
| 74002  | K10401442      | RESIDENCE           | Dwelling               | 0.000773013    | 0.0043                 | WLA    |
|        |                | TACKETT             | Other than             |                |                        | KPDES  |
| 74181  | KYG401470      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
| , 1101 | 11 3 701 4 70  | RESIDENCE           | Dwelling               | 3.000773013    | 0.0015                 | V 12/1 |
|        |                | HALL                | Other than             |                |                        | KPDES  |
| 74185  | KYG401475      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
|        |                |                     | Dwelling               |                |                        |        |
|        |                | COLLINS             | Other than             |                |                        | KPDES  |
| 1168   | KYG401516      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |
|        |                |                     | Dwelling               |                |                        |        |
|        |                | KEATHLEY            | Other than             |                |                        | KPDES  |
| 35892  | KYG401529      | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                 | WLA    |

| AI     |               | Discharger Facility |                        | Design         | <u>E</u> . <u>coli</u><br>(billion |   |
|--------|---------------|---------------------|------------------------|----------------|------------------------------------|---|
| number | KPDES#        | Name                | Туре                   | Capacity (cfs) | colonies/day)                      |   |
|        |               |                     | Dwelling               |                |                                    |   |
|        |               | MOORE               | Other than             |                |                                    | KPDES                                   |
| 35887  | KYG401533     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
|        |               | WALL OF             | Dwelling               |                |                                    |   |
| 42120  | 17370401540   | WALLACE             | Other than             | 0.000773615    | 0.0045                             | KPDES                                   |
| 43120  | KYG401540     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
|        |               | MOVININEV           | Dwelling<br>Other than |                |                                    | LIDDEC                                  |
| 36057  | KYG401541     | MCKINNEY            | Apartment              | 0.000773615    | 0.0045                             | KPDES                                   |
| 30037  | K10401341     | RESIDENCE           | Dwelling               | 0.000773013    | 0.0045                             | WLA                                     |
|        |               | PRATER              | Other than             |                |                                    | KPDES                                   |
| 43224  | KYG401548     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
| 43224  | K10401346     | RESIDENCE           | Dwelling               | 0.000773013    | 0.0043                             | WLA                                     |
|        |               | CAUDILL             | Other than             |                |                                    | KPDES                                   |
| 44695  | KYG401580     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
| 11075  | 11.3 101300   | TESIDENCE           | Dwelling               | 0.000773013    | 0.0010                             | V 1 12 1 1                              |
|        |               | DINGUS              | Other than             |                |                                    | KPDES                                   |
| 45073  | KYG401582     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
|        |               |                     | Dwelling               |                |                                    |   |
|        |               | GEARHEART           | Other than             |                |                                    | KPDES                                   |
| 45396  | KYG401587     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
|        |               |                     | Dwelling               |                |                                    |   |
|        |               | HALL                | Other than             |                |                                    | KPDES                                   |
| 45070  | KYG401590     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
|        |               |                     | Dwelling               |                |                                    |   |
|        |               | WILLIAMSON          | Other than             |                |                                    | KPDES                                   |
| 46144  | KYG401601     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
|        |               |                     | Dwelling               |                |                                    |   |
|        |               | CHILDERS            | Other than             |                |                                    | KPDES                                   |
| 46147  | KYG401603     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
|        |               |                     | Dwelling               |                |                                    |   |
| 4=000  | ******        | LAFERTY             | Other than             |                | 0.0045                             | KPDES                                   |
| 47022  | KYG401638     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
|        |               | DUEE                | Dwelling               |                |                                    | LADDEC                                  |
| 10061  | VVC401645     | DUFF                | Other than             | 0.000772615    | 0.0045                             | KPDES                                   |
| 48864  | KYG401645     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
|        |               | COCHRAN             | Dwelling<br>Other than |                |                                    | KPDES                                   |
| 48897  | KYG401646     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
| 70077  | 11 0 7010 70  | KEDIDENCE           | Dwelling               | 0.000773013    | 0.0073                             | WLA                                     |
|        |               | YORK                | Other than             |                |                                    | KPDES                                   |
| 49354  | KYG401654     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
| .,,,,, | 121 3 10100 1 | THE STEEL THE       | Dwelling               | 0.000773013    | 0.00.0                             | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
|        |               | BLANKENSHIP         | Other than             |                |                                    | KPDES                                   |
| 50021  | KYG401692     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
|        |               |                     | Dwelling               |                |                                    |   |
|        |               | JUSTICE             | Other than             |                |                                    | KPDES                                   |
| 50138  | KYG401699     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |
|        |               |                     | Dwelling               |                |                                    |   |
|        |               | SCOTT               | Other than             |                |                                    | KPDES                                   |
| 50627  | KYG401721     | RESIDENCE           | Apartment              | 0.000773615    | 0.0045                             | WLA                                     |

| AI     | KDDEC //     | Discharger Facility  | T                      | Design         | E. coli<br>(billion |   |
|--------|--------------|----------------------|------------------------|----------------|---------------------|---|
| number | KPDES #      | Name                 | Type                   | Capacity (cfs) | colonies/day)       |   |
|        |              | MIDD                 | Dwelling               |                |                     | LIDDEC                                  |
| 50050  | WWC 401720   | KIDD                 | Other than             | 0.000772615    | 0.0045              | KPDES                                   |
| 50950  | KYG401730    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
|        |              | MOWDDIEWID           | Dwelling               |                |                     | LIBBEG                                  |
| 52021  | 1/3/0401764  | MCKINNEY JR          | Other than             | 0.000772615    | 0.0045              | KPDES                                   |
| 53921  | KYG401764    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
|        |              | ICOM                 | Dwelling               |                |                     | LADDEC                                  |
| 54970  | VVC401773    | ISON                 | Other than             | 0.000772615    | 0.0045              | KPDES                                   |
| 54879  | KYG401772    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
|        |              | NICHAAN              | Dwelling               |                |                     | LIDDEC                                  |
| 71436  | KYG401809    | NEWMAN<br>RESIDENCE  | Other than             | 0.000773615    | 0.0045              | KPDES                                   |
| /1430  | K10401809    | KESIDENCE            | Apartment              | 0.000773013    | 0.0045              | WLA                                     |
|        |              | COMBS                | Dwelling<br>Other than |                |                     | KPDES                                   |
| 74243  | KYG401821    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
| 74243  | K1U401821    | RESIDENCE            | Dwelling               | 0.000773013    | 0.0045              | WLA                                     |
|        |              | LITTLE               | Other than             |                |                     | KPDES                                   |
| 75141  | KYG401851    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
| /3141  | K10401031    | RESIDENCE            | Dwelling               | 0.000773013    | 0.0043              | WLA                                     |
|        |              | HOWARD               | Other than             |                |                     | KPDES                                   |
| 75556  | KYG401857    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
| 73330  | K10101057    | RESIDENCE            | Dwelling               | 0.000775015    | 0.0043              | VVE                                     |
|        |              | ROWE                 | Other than             |                |                     | KPDES                                   |
| 75746  | KYG401868    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
| 75710  | 1210101000   | REGIBERCE            | Dwelling               | 0.000775015    | 0.0012              | *************************************** |
|        |              | BILITER              | Other than             |                |                     | KPDES                                   |
| 76078  | KYG401876    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
|        |              |                      | Dwelling               |                |                     |   |
|        |              | ALLEN                | Other than             |                |                     | KPDES                                   |
| 76185  | KYG401883    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
|        |              |                      | Dwelling               |                |                     |   |
|        |              | HARVEL               | Other than             |                |                     | KPDES                                   |
| 79525  | KYG401931    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
|        |              |                      | Dwelling               |                |                     |   |
|        |              | BENTLEY              | Other than             |                |                     | KPDES                                   |
| 79842  | KYG401936    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
|        |              |                      | Dwelling               |                |                     |   |
| 01100  | WWG 4040=6   | MARTIN               | Other than             | 0.000==0.015   | 0.004=              | KPDES                                   |
| 81193  | KYG401970    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
|        |              | COARCERRY            | Dwelling               |                |                     | LADDEC                                  |
| 01570  | 1/1/0/101001 | SCARBERRY            | Other than             | 0.000772615    | 0.0045              | KPDES                                   |
| 81570  | KYG401981    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
|        |              | HODEING              | Dwelling<br>Other than |                |                     | LIDDEC                                  |
| 82471  | KYG402002    | HOPKINS<br>RESIDENCE | Apartment              | 0.000773615    | 0.0045              | KPDES<br>WLA                            |
| 024/1  | K 1 U402002  | RESIDENCE            | Dwelling               | 0.000773013    | 0.0043              | WLA                                     |
|        |              | COOK                 | Other than             |                |                     | KPDES                                   |
| 84292  | KYG402025    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
| 07272  | 11 0 402023  | KESIDENCE            | Dwelling               | 0.000773013    | 0.0043              | WLA                                     |
|        |              | PRATER               | Other than             |                |                     | KPDES                                   |
| 97291  | KYG402063    | RESIDENCE            | Apartment              | 0.000773615    | 0.0045              | WLA                                     |
| 71471  | 111 0 102003 | TESTDERICE           | 1 ipartificit          | 3.000773013    | 0.0010              | *                                       |

Final
Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

September, 2010

| AI     |           | Discharger Facility |                                     | Design         | <u>E</u> . <u>coli</u><br>(billion |                         |
|--------|-----------|---------------------|-------------------------------------|----------------|------------------------------------|-------------------------|
| number | KPDES#    | Name                | Type                                | Capacity (cfs) | colonies/day)                      |                         |
| 103052 | KYG402117 | LITTLE<br>RESIDENCE | Dwelling<br>Other than<br>Apartment | 0.000773615    | 0.0045                             | KPDES<br>WLA            |
|        |           |                     |                                     |                | 7.0609                             | Total<br>KPDES<br>WLA   |
|        |           |                     | Addition to MAF (sum                |                |                                    |                         |
|        |           |                     | of cfs)                             | 1.202506386    | 1667.1549                          | remainder               |
|        |           |                     |                                     |                | 16.6715                            | Future<br>Growth<br>WLA |
|        |           |                     |                                     |                | 23.7324                            | Total WLA               |
|        |           |                     |                                     |                | 1650.4834                          | LA                      |

# **Right Fork Beaver Creek Site 30**

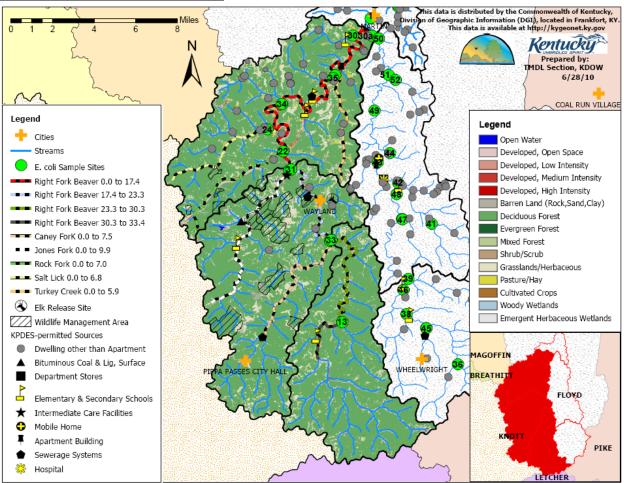


Figure E.4 Right Fork Beaver Creek Site 30

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 27 is under site 35, site 20 is under site 31, site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Right Fork Beaver Creek at site 30 (RM 1.4) is a fourth order stream located in Floyd County (Figure E.4). Its watershed consists of the Upper, Middle, and the majority of the Lower Right Fork Beaver Creek subwatersheds and extends from Knott into Floyd County. Information about Right Fork Beaver Creek at site 30, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.16. It has a catchment of 98,511 acres (154) square miles) with a 79% forested and 6 % developed land cover (Table E.17). There are several wildlife management areas and an Elk release site in this subwatershed (Figure E.4). Portions of this watershed are sewered; especially in larger cities (see Figures 5.17 and 5.18). There are three stream water withdrawals in this subwatershed (Table E.18). Sampling data from site 30 is presented in Table E.19, and the TMDL allocations in Table E.20.

Table E.16 Right Fork Beaver Creek Site 30 Information

| Straam | Stream  | WDID #    | Country  | Aaraa    | Square  | Stroom Order  |        |        |         |
|--------|---------|-----------|----------|----------|---------|---------------|--------|--------|---------|
| Stream | Segment | WBID#     | County   | Acres    | Miles   | Stream Order  |        |        |         |
|        | Right   |           |          |          |         |               |        |        |         |
|        | Fork    |           |          |          |         |               |        |        |         |
| Right  | Beaver  |           |          |          |         |               |        |        |         |
| Fork   | Creek   |           |          |          |         |               |        |        |         |
| Beaver | 0.0 to  |           |          |          |         |               |        |        |         |
| Creek  | 17.4    | 501863_01 | Floyd    | 98510.89 | 153.923 | 4th order     |        |        |         |
|        |         |           |          | Sample   |         |               |        |        |         |
|        |         |           | Sample   | Site     |         |               | + to   | - from | Adjuste |
| EKU    | MAP     | Sample    | Site     | Longitud | MAF     | RM of MAF     | MAF    | MAF    | d MAF   |
| Site # | Site #  | Point RM  | Latitude | e        | (cfs)   | Determination | (cfs)  | (cfs)  | (cfs)   |
| 30     | 30      | 1.4       | 37.5591  | -82.7723 | 204.7   | 1.4           | 0.4781 | 1.4312 | 203.747 |

Table E.17 Right Fork Beaver Creek Site 30 Subwatershed Land Cover

|                      |                 | Watershed    | % of Total | Future Growth |
|----------------------|-----------------|--------------|------------|---------------|
| Land Cover           | Watershed Acres | Square Miles | Area       | WLA %         |
| Open Water           | 75.82           | 0.12         | 0.08       |               |
| Developed            | 5899.02         | 9.22         | 5.99       | 1             |
| Barren Land          | 1200.14         | 1.88         | 1.22       |               |
| Forest/Shrubland     | 77424.52        | 120.98       | 78.59      |               |
| Grassland/Herbaceous | 10740.04        | 16.78        | 10.90      |               |
| Pasture/ Hay         | 2991.84         | 4.67         | 3.04       |               |
| Cultivated Crops     | 164.91          | 0.26         | 0.17       |               |
| Wetlands             | 14.59           | 0.02         | 0.01       |               |
| Totals               | 98510.89        | 153.92       | 100.00     |               |

Table E.18 Right Fork Beaver Creek Site 30 Water Withdrawals

| AI     | Source      | Withdrawal Facility    | Withdrawal, | Facility | Facility  |
|--------|-------------|------------------------|-------------|----------|-----------|
| number | Description | Name                   | cfs         | Latitude | Longitude |
|        | RM 40.6     |                        |             |          |           |
|        | Right Fork  |                        |             |          |           |
|        | Beaver      | ICG Knott Co LLC (860- |             |          |           |
| 2528   | Creek       | 8012)                  | 0.410016    | 37.32166 | -82.80366 |
|        | RM 31.0     |                        |             |          |           |
|        | Right Fork  |                        |             |          |           |
|        | Beaver      | Deane Mining LLC (860- |             |          |           |
| 2525   | Creek       | 5318)                  | 0.015472    | 37.41038 | -82.78096 |
|        | RM 4.2 of   |                        |             |          |           |
|        | Caney       |                        |             |          |           |
| 3502   | Creek       | ICG Knott Co LLC       | 1.005699    | 37.3884  | -82.82856 |
|        |             | subtraction from MAF   | 1.431187    |          |           |

Table E.19 Right Fork Beaver Creek Site 30 Data

| TWOIV EXTY TUBIN T OTH EV |               |        |               |                                 |
|---------------------------|---------------|--------|---------------|---------------------------------|
|                           |               |        | Instantaneous |                                 |
|                           | E. coli       |        | Load (billion | Unit Area Load                  |
|                           | (colonies/100 | Flow   | E. coli       | (million <u>E</u> . <u>coli</u> |
| Collection Date           | mls)          | (cfs)  | colonies/day) | colonies/day/acre)              |
| 05/16/07                  | 310           | 70.79  | 536.90        | 5.45                            |
| 05/30/07                  | 310           | 29.77  | 225.79        | 2.29                            |
| 5/30/2007 (QA             |               |        |               |                                 |
| Sample)                   | 490           | N/A    | N/A           | N/A                             |
| 06/13/07                  | 180           | 19.27  | 84.86         | 0.86                            |
| 06/27/07                  | 3700          | 63.551 | 5752.85       | 58.40                           |
| 07/10/07                  | 220           | 11.799 | 63.51         | 0.64                            |
| 07/26/07                  | 13000         | N/A    | N/A           |                                 |
| 08/17/07                  | 210           | 7.202  | 37.00         | 0.38                            |
| 8/17/2007 (QA             |               |        |               |                                 |
| Sample)                   | 140           | N/A    | N/A           | N/A                             |
| 08/31/07                  | 160           | N/A    | N/A           | N/A                             |
| 09/14/07                  | 180           | N/A    | N/A           | N/A                             |
| 09/28/07                  | 330           | N/A    | N/A           | N/A                             |
| 10/12/07                  | 40            | 25.701 | 25.15         | 0.26                            |
| 11/16/07 (outside PCR     |               |        |               |                                 |
| season)                   | 110           | 0.371  | 1.00          | 0.01                            |
| Greatest Concentration    | 13000         |        |               |                                 |

Table E.20 TMDLs for Right Fork Beaver Creek Site 30

|        | TO TIVID ED TO | Right Fork DC | aver ereen b | 1        | E sali (billian  |               |
|--------|----------------|---------------|--------------|----------|------------------|---------------|
| TMDL   |                |               |              |          | E. coli (billion |               |
| Table  |                |               |              |          | colonies/day)    |               |
|        |                |               |              |          | 64802.6938       | Existing Load |
|        |                |               |              |          | 1196.3574        | Total TMDL    |
|        |                |               |              |          | 119.6357         | MOS           |
|        |                |               |              |          | 1076.7217        | TMDL Target   |
|        |                |               |              | Design   |                  |               |
| AI     |                | Discharger    |              | Capacity |                  |               |
| number | KPDES#         | Facility Name | Type         | (cfs)    | 98.34            | % reduction   |
|        |                | KNOTT CO      | 3.1          | ` ′      |                  |               |
|        |                | WATER &       | Sewerage     |          |                  | KPDES         |
| 2527   | KY0042854      | SEWER DIST    | System       | 0.154723 | 0.9085           | WLA           |
|        |                | WARCO         |              |          |                  |               |
|        |                | HOUSING       | Apartment    |          |                  | KPDES         |
| 1352   | KY0072974      | PROJECT       | Building     | 0.038681 | 0.2271           | WLA           |
| 1552   | 11100/2011     | ALLEN         | Zunung       | 0.020001 | U,,1             | ,, 211        |
|        |                | CENTRAL       |              |          |                  |               |
|        |                | HIGH          |              |          |                  | KPDES         |
| 25254  | 1/3/0070420    |               | 0.1.1        | 0.01702  | 0.0000           | ,             |
| 35254  | KY0079430      | SCHOOL        | School       | 0.01702  | 0.0999           | WLA           |

|        |              |                   |                        | Design   |                  |           |
|--------|--------------|-------------------|------------------------|----------|------------------|-----------|
| AI     |              | Discharger        |                        | Capacity | E. coli (billion |           |
| number | KPDES#       | Facility Name     | Туре                   | (cfs)    | colonies/day)    |           |
|        |              | GOLDEN            |                        |          |                  |           |
| 2-1-   | *****        | YEARS REST        | Intermediate           |          |                  | KPDES     |
| 2517   | KY0083089    | HOME              | Care facility          | 0.015472 | 0.0908           | WLA       |
|        |              | JONES FORK        |                        |          |                  | LADDEC    |
| 35359  | KY0087076    | ELEM              | School                 | 0.009283 | 0.0545           | KPDES     |
| 33339  | K1008/0/0    | SCHOOL<br>JAMES A | School                 | 0.009283 | 0.0545           | WLA       |
|        |              | DUFF ELEM         |                        |          |                  | KPDES     |
| 35258  | KY0093017    | SCHOOL            | School                 | 0.012378 | 0.0727           | WLA       |
| 33230  | K10073017    | CONSOL OF         | Bituminous             | 0.012370 | 0.0727           | VILIT     |
|        |              | KY INC            | Coal & Lig,            |          |                  | KPDES     |
| 2514   | KY0094510    | JONES FORK        | Surface                | 0.004642 | 0.0273           | WLA       |
|        |              | WAYLAND           | Sewerage               |          |                  | KPDES     |
| 35761  | KY0105228    | STP               | System                 | 0.154723 | 0.9085           | WLA       |
|        |              | MAY               |                        |          |                  |           |
|        |              | VALLEY            |                        |          |                  |           |
|        |              | ELEM              |                        |          |                  | KPDES     |
| 82092  | KY0106755    | SCHOOL            | School                 | 0.009283 | 0.0545           | WLA       |
|        |              |                   | Sewerage               |          |                  | KPDES     |
| 35260  | KY0107051    | EASTERN STP       | System                 | 0.038681 | 0.2271           | WLA       |
|        |              |                   | Dwelling               |          |                  |           |
|        |              | GOBLE             | Other than             |          |                  | KPDES     |
| 1196   | KYG400590    | RESIDENCE         | Apartment              | 0.000774 | 0.0045           | WLA       |
|        |              | CDEEN             | Dwelling               |          |                  |           |
| 1100   | 177767400703 | GREEN             | Other than             | 0.000774 | 0.0045           | KPDES     |
| 1199   | KYG400603    | RESIDENCE         | Apartment              | 0.000774 | 0.0045           | WLA       |
|        |              | ALLEN             | Dwelling<br>Other than |          |                  | KPDES     |
| 1133   | KYG400642    | RESIDENCE         | Apartment              | 0.000774 | 0.0045           | WLA       |
| 1133   | K1 0400042   | RESIDENCE         | Dwelling               | 0.000774 | 0.0043           | WLA       |
|        |              | MITCHELL          | Other than             |          |                  | KPDES     |
| 1270   | KYG400666    | RESIDENCE         | Apartment              | 0.000774 | 0.0045           | WLA       |
|        |              |                   | Dwelling               |          |                  |           |
|        |              | HOOVER            | Other than             |          |                  | KPDES     |
| 1222   | KYG400730    | RESIDENCE         | Apartment              | 0.000774 | 0.0045           | WLA       |
|        |              |                   | Dwelling               |          |                  |           |
| 40.15  |              | TURNER            | Other than             |          |                  | KPDES     |
| 1343   | KYG400778    | RESIDENCE         | Apartment              | 0.000774 | 0.0045           | WLA       |
|        |              | DEDIZBIO          | Dwelling               |          |                  | LABBEC    |
| 1202   | WWC400026    | PERKINS           | Other than             | 0.000774 | 0.0045           | KPDES     |
| 1293   | KYG400836    | RESIDENCE         | Apartment              | 0.000774 | 0.0045           | WLA       |
|        |              | SHEPHERD          | Dwelling<br>Other than |          |                  | KPDES     |
| 1314   | KYG400844    | RESIDENCE         | Apartment              | 0.000774 | 0.0045           | WLA       |
| 1317   | 111 3 100014 | RESIDENCE         | Dwelling               | 0.000777 | 0.0013           | VV 42/1 X |
|        |              | KESTER            | Other than             |          |                  | KPDES     |
| 1243   | KYG400915    | RESIDENCE         | Apartment              | 0.000774 | 0.0045           | WLA       |
|        |              |                   | Dwelling               |          |                  |           |
|        |              | MULLINS           | Other than             |          |                  | KPDES     |
| 1276   | KYG400975    | RESIDENCE         | Apartment              | 0.000774 | 0.0045           | WLA       |

|        |                |   |                        | Design   |                  |        |
|--------|----------------|---|------------------------|----------|------------------|--------|
| AI     |                | Discharger                              |                        | Capacity | E. coli (billion |        |
| number | KPDES#         | Facility Name                           | Type                   | (cfs)    | colonies/day)    |        |
|        |                |   | Dwelling               |          |                  |        |
|        |                | MAY                                     | Other than             |          |                  | KPDES  |
| 4327   | KYG401073      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                |   | Dwelling               |          |                  |        |
|        |                | CASTLE                                  | Other than             |          |                  | KPDES  |
| 4350   | KYG401113      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                |   | Dwelling               |          |                  |        |
|        |                | FRASURE                                 | Other than             |          |                  | KPDES  |
| 4344   | KYG401121      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                |   | Dwelling               |          |                  |        |
|        |                | CRUM                                    | Other than             |          |                  | KPDES  |
| 4336   | KYG401125      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                |   | Dwelling               |          |                  |        |
|        |                | SHEPPARD                                | Other than             |          |                  | KPDES  |
| 12253  | KYG401218      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                |   | Dwelling               |          |                  |        |
| 4      |                | WEBB                                    | Other than             |          |                  | KPDES  |
| 15655  | KYG401296      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                |   | Dwelling               |          |                  |        |
| 15005  | TTTTC 401050   | EVERIDGE                                | Other than             | 0.000554 | 0.004-           | KPDES  |
| 15807  | KYG401352      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                | WW. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | Dwelling               |          |                  | LIBBER |
| 22270  | TTTTC 401050   | WILLIAMSON                              | Other than             | 0.000554 | 0.0045           | KPDES  |
| 33378  | KYG401353      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                | TT A T T                                | Dwelling               |          |                  | LIDDEG |
| 74105  | 17370 401 475  | HALL                                    | Other than             | 0.000774 | 0.0045           | KPDES  |
| 74185  | KYG401475      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                | WALLACE                                 | Dwelling<br>Other than |          |                  | LIDDEC |
| 43120  | KYG401540      | WALLACE<br>RESIDENCE                    |                        | 0.000774 | 0.0045           | KPDES  |
| 43120  | K10401340      | KESIDENCE                               | Apartment Dwelling     | 0.000774 | 0.0045           | WLA    |
|        |                | PRATER                                  | Other than             |          |                  | KPDES  |
| 43224  | KYG401548      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
| 73224  | K10401340      | RESIDENCE                               | Dwelling               | 0.000774 | 0.0043           | WLA    |
|        |                | CHILDERS                                | Other than             |          |                  | KPDES  |
| 46147  | KYG401603      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
| 101-T/ | 11 3 10 10 0 3 | TESTDENCE                               | Dwelling               | 0.000774 | 0.0013           | WEAT   |
|        |                | SCOTT                                   | Other than             |          |                  | KPDES  |
| 50627  | KYG401721      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
| 20027  |                |   | Dwelling               | 2.300771 | 3,00,10          | 77221  |
|        |                | KIDD                                    | Other than             |          |                  | KPDES  |
| 50950  | KYG401730      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                |   | Dwelling               |          |                  |        |
|        |                | ISON                                    | Other than             |          |                  | KPDES  |
| 54879  | KYG401772      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                |   | Dwelling               |          |                  |        |
|        |                | HOWARD                                  | Other than             |          |                  | KPDES  |
| 75556  | KYG401857      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |
|        |                |   | Dwelling               |          |                  |        |
|        |                | BILITER                                 | Other than             |          |                  | KPDES  |
| 76078  | KYG401876      | RESIDENCE                               | Apartment              | 0.000774 | 0.0045           | WLA    |

Final
Beaver Creek Watershed E. coli TMDL

September, 2010

|           |                  | Design   |             |               |           |        |
|-----------|------------------|----------|-------------|---------------|-----------|--------|
|           | E. coli (billion | Capacity |             | Discharger    |           | AI     |
|           | colonies/day)    | (cfs)    | Туре        | Facility Name | KPDES#    | number |
|           |                  |          | Dwelling    | -             |           |        |
| KPDES     |                  |          | Other than  | SCARBERRY     |           |        |
| WLA       | 0.0045           | 0.000774 | Apartment   | RESIDENCE     | KYG401981 | 81570  |
|           |                  |          | Dwelling    |               |           |        |
| KPDES     |                  |          | Other than  | COOK          |           |        |
| WLA       | 0.0045           | 0.000774 | Apartment   | RESIDENCE     | KYG402025 | 84292  |
|           |                  |          | Dwelling    |               |           |        |
| KPDES     |                  |          | Other than  | PRATER        |           |        |
| WLA       | 0.0045           | 0.000774 | Apartment   | RESIDENCE     | KYG402063 | 97291  |
| Total     |                  |          |             |               |           |        |
| KPDES     |                  |          |             |               |           |        |
| WLA       | 2.8073           |          |             |               |           |        |
|           |                  |          | Addition to |               |           |        |
|           |                  |          | MAF (sum    |               |           |        |
| remainder | 1073.9144        | 0.478094 | of cfs)     |               |           |        |
| Future    |                  |          |             |               |           |        |
| Growth    |                  |          |             |               |           |        |
| WLA       | 10.7391          |          |             |               |           |        |
| Total WLA | 13.5464          |          |             |               |           |        |
| LA        | 1063.1753        |          |             |               |           |        |

## Right Beaver Creek Site 30a

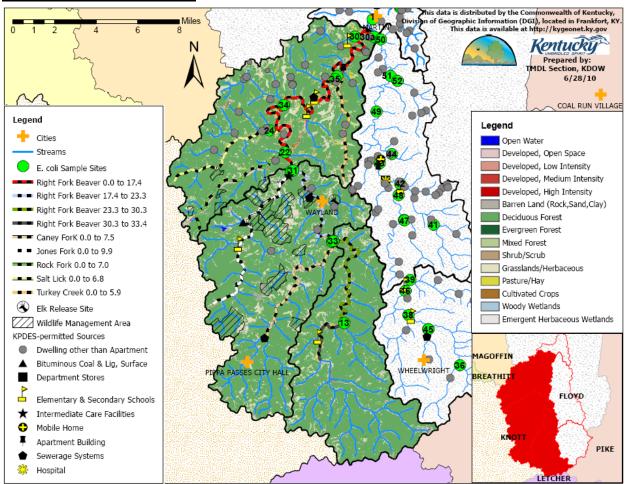


Figure E.5 Right Fork Beaver Creek Site 30a

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 27 is under site 35, site 20 is under site 31, site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Right Fork Beaver Creek at site 30a (RM 0.2) is a fourth order stream located in Floyd County (Figure E.5). Its watershed consists of the Upper, Middle, and Lower Right Fork Beaver Creek subwatersheds and extends from Knott into Floyd County. Information about Right Fork Beaver Creek at site 30a, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.21. It has a catchment of 99,096 acres (155 square miles) with a 79% forested and 6 % developed land cover (Table E.22). There are several wildlife management areas and an elk release site in this subwatershed (Figure E.5). Portions of this watershed are sewered; especially in larger cities (see Figures 5.17 and 5.18). There are three stream water withdrawals in this subwatershed (Table E.23). Sampling data from site 30a is presented in Table E.24, and the TMDL allocations in Table E.25.

Table E.21 Right Fork Beaver Creek Site 30a Information

|        | <u> </u>          |           |          |           |                 |               |         |         |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|---------|----------|
| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |         |          |
|        | Right             |           |          |           |                 |               |         |         |          |
|        | Fork              |           |          |           |                 |               |         |         |          |
| Right  | Beaver            |           |          |           |                 |               |         |         |          |
| Fork   | Creek             |           |          |           |                 |               |         |         |          |
| Beaver | 0.0 to            |           |          |           |                 |               |         |         |          |
| Creek  | 17.4              | 501863_01 | Floyd    | 99095.56  | 154.837         | 4th order     |         |         |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from  | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 30a    | 30a               | 0.2       | 37.55840 | -82.75550 | 205.9           | 0             | 0.47887 | 1.43119 | 204.9477 |

Table E.22 Right Fork Beaver Creek Site 30a Subwatershed Land Cover

|                       | Watershed | Watershed    |                 | Future Growth |
|-----------------------|-----------|--------------|-----------------|---------------|
| Land Cover            | Acres     | Square Miles | % of Total Area | WLA %         |
| Open Water            | 76.27     | 0.12         | 0.08            |               |
| Developed             | 5934.03   | 9.27         | 5.99            | 1.0           |
| Barren Land           | 1207.26   | 1.89         | 1.22            |               |
| Forest/Shrubland      | 77884.04  | 121.69       | 78.59           |               |
| Grassland/ Herbaceous | 10803.79  | 16.88        | 10.90           |               |
| Pasture/Hay           | 3009.60   | 4.70         | 3.04            |               |
| Cultivated Crops      | 165.89    | 0.26         | 0.17            |               |
| Wetlands              | 14.68     | 0.02         | 0.01            |               |
| Total                 | 99095.56  | 154.84       | 100.00          |               |

Table E.23 Right Fork Beaver Creek Site 30a Water Withdrawals

| AI     | Source       | Withdrawal Facility |                 | Facility | Facility  |
|--------|--------------|---------------------|-----------------|----------|-----------|
| number | Description  | Name                | Withdrawal, cfs | Latitude | Longitude |
|        | RM 40.6      |                     |                 |          |           |
|        | Right Fork   | ICG Knott Co LLC    |                 |          |           |
| 2528   | Beaver Creek | (860-8012)          | 0.4100156       | 37.32166 | -82.80366 |
|        | RM 31.0      |                     |                 |          |           |
|        | Right Fork   | Deane Mining LLC    |                 |          |           |
| 2525   | Beaver Creek | (860-5318)          | 0.01547229      | 37.41038 | -82.78096 |
|        | RM 4.2 of    |                     |                 |          |           |
| 3502   | Caney Creek  | ICG Knott Co LLC    | 1.005699        | 37.3884  | -82.82856 |
|        |              | subtraction from    |                 |          |           |
|        |              | MAF                 | 1.43118689      |          |           |

Table E.24 Right Fork Beaver Creek Site 30a Data

| Collection<br>Date     | E. coli<br>(colonies/100<br>mls) | Flow<br>(cfs) | Instantaneous Load (billion <u>E</u> . <u>coli</u> colonies/day) | Unit Area Load (million <u>E</u> . <u>coli</u> colonies/day/acre) |
|------------------------|----------------------------------|---------------|--|---|
| 05/16/08               | 560                              | 65.85         | 902.20   | 9.10  |
| 05/30/08               | 140                              | 26.3          | 90.08  | 0.91  |
| 06/13/08               | 500                              | 26.876        | 328.77   | 3.32  |
| 06/27/08               | 250                              | 10.230        | 62.57  | 0.63  |
| 07/11/08               | 680                              | 44.002        | 732.05   | 7.39  |
| 07/31/08               | 3800                             | N/A           | N/A  | N/A   |
| 08/08/08               | 500                              | 22.4328       | 274.42   | 2.77  |
| 08/22/08               | 150                              | 7.995         | 29.34  | 0.30  |
| 09/12/08               | 110                              | 11.121        | 29.93  | 0.30  |
| 09/20/08               | 120                              | 7.015         | 20.60  | 0.21  |
| 10/17/08               | 50                               | 8.743         | 10.70  | 0.11  |
| 10/24/08               | 90                               | 7.326         | 16.13  | 0.16  |
| Greatest Concentration | 3800                             |               |  |   |

Table E.25 TMDLs for Right Fork Beaver Creek Site 30a

| TMDL   |           | JI RIGHT OIK D |               |          | E. coli (billion |               |
|--------|-----------|----------------|---------------|----------|------------------|---------------|
| Table  |           |                |               |          | colonies/day)    |               |
|        |           |                |               |          | 19053.9617       | Existing Load |
|        |           |                |               |          | 1203.4081        | Total TMDL    |
|        |           |                |               |          | 120.3408         | MOS           |
|        |           |                |               |          | 1083.0673        | TMDL Target   |
|        |           |                |               | Design   |                  |               |
| AI     |           | Discharger     |               | Capacity |                  |               |
| number | KPDES#    | Facility Name  | Туре          | (cfs)    | 94.32            | % reduction   |
|        |           | KNOTT CO       |               |          |                  |               |
|        |           | WATER &        | Sewerage      |          |                  | KPDES         |
| 2527   | KY0042854 | SEWER DIST     | System        | 0.154723 | 0.9085           | WLA           |
|        |           | WARCO          |               |          |                  |               |
|        |           | HOUSING        | Apartment     |          |                  | KPDES         |
| 1352   | KY0072974 | PROJECT        | Building      | 0.038681 | 0.2271           | WLA           |
|        |           | ALLEN          |               |          |                  |               |
|        |           | CENTRAL        |               |          |                  |               |
|        |           | HIGH           |               |          |                  | KPDES         |
| 35254  | KY0079430 | SCHOOL         | School        | 0.01702  | 0.0999           | WLA           |
|        |           | GOLDEN         |               |          |                  |               |
|        |           | YEARS REST     | Intermediate  |          |                  | KPDES         |
| 2517   | KY0083089 | HOME           | Care Facility | 0.015472 | 0.0908           | WLA           |
|        |           | JONES FORK     |               |          |                  |               |
|        |           | ELEM           |               |          |                  | KPDES         |
| 35359  | KY0087076 | SCHOOL         | School        | 0.009283 | 0.0545           | WLA           |

|        |              |                |                        | Design   |                  |   |
|--------|--------------|----------------|------------------------|----------|------------------|---|
| AI     |              | Discharger     |                        | Capacity | E. coli (billion |   |
| number | KPDES#       | Facility Name  | Type                   | (cfs)    | colonies/day)    |   |
|        |              | JAMES A        |                        |          |                  |   |
|        |              | DUFF ELEM      |                        |          |                  | KPDES                                   |
| 35258  | KY0093017    | SCHOOL         | School                 | 0.012378 | 0.0727           | WLA                                     |
|        |              | CONSOL OF      | Bituminous             |          |                  |   |
| 0514   | 17170004510  | KY INC         | Coal & Lig,            | 0.004642 | 0.0053           | KPDES                                   |
| 2514   | KY0094510    | JONES FORK     | Surface                | 0.004642 | 0.0273           | WLA<br>KPDES                            |
| 35761  | KY0105228    | WAYLAND<br>STP | Sewerage               | 0.154722 | 0.0005           | 17                                      |
| 33/01  | K 1 0103228  |                | System                 | 0.154723 | 0.9085           | WLA                                     |
|        |              | MAY<br>VALLEY  |                        |          |                  |   |
|        |              | ELEM           |                        |          |                  | KPDES                                   |
| 82092  | KY0106755    | SCHOOL         | School                 | 0.009283 | 0.0545           | WLA                                     |
| 02092  | K10100733    | SCHOOL         | Sewerage               | 0.009283 | 0.0343           | KPDES                                   |
| 35260  | KY0107051    | EASTERN STP    | System                 | 0.038681 | 0.2271           | WLA                                     |
| 33200  | 1210107001   | Engrena ( )    | Dwelling               | 0.020001 | 0.2271           | ******                                  |
|        |              | GOBLE          | Other than             |          |                  | KPDES                                   |
| 1196   | KYG400590    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | WLA                                     |
|        |              |                | Dwelling               |          |                  |   |
|        |              | GREEN          | Other than             |          |                  | KPDES                                   |
| 1199   | KYG400603    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | WLA                                     |
|        |              |                | Dwelling               |          |                  |   |
|        |              | ALLEN          | Other than             |          |                  | KPDES                                   |
| 1133   | KYG400642    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | WLA                                     |
|        |              |                | Dwelling               |          |                  |   |
| 1070   | 177767400777 | MITCHELL       | Other than             | 0.000774 | 0.0045           | KPDES                                   |
| 1270   | KYG400666    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | WLA                                     |
|        |              | HOOVER         | Dwelling<br>Other than |          |                  | KPDES                                   |
| 1222   | KYG400730    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | WLA                                     |
| 1222   | K1 0400730   | RESIDENCE      | Dwelling               | 0.000774 | 0.0043           | WLA                                     |
|        |              | TURNER         | Other than             |          |                  | KPDES                                   |
| 1343   | KYG400778    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | WLA                                     |
|        |              |                | Dwelling               |          | 0,000            | ,,,                                     |
|        |              | PERKINS        | Other than             |          |                  | KPDES                                   |
| 1293   | KYG400836    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | WLA                                     |
|        |              |                | Dwelling               |          |                  |   |
|        |              | SHEPHERD       | Other than             |          |                  | KPDES                                   |
| 1314   | KYG400844    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | WLA                                     |
|        |              | WE             | Dwelling               |          |                  |   |
| 10.40  | I/X/C/100015 | KESTER         | Other than             | 0.000774 | 0.0045           | KPDES                                   |
| 1243   | KYG400915    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | WLA                                     |
|        |              | MULLINS        | Dwelling<br>Other than |          |                  | KDDEC                                   |
| 1276   | KYG400975    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | KPDES<br>WLA                            |
| 12/0   | K10400973    | RESIDENCE      | Dwelling               | 0.000774 | 0.0043           | WLA                                     |
|        |              | MAY            | Other than             |          |                  | KPDES                                   |
| 4327   | KYG401073    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | WLA                                     |
| .527   | 3.01073      |                | Dwelling               |          |                  | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
|        |              | CASTLE         | Other than             |          |                  | KPDES                                   |
| 4350   | KYG401113    | RESIDENCE      | Apartment              | 0.000774 | 0.0045           | WLA                                     |

|        |              |                   |                    | Design   |   |   |
|--------|--------------|-------------------|--------------------|----------|---|---|
| AI     |              | Discharger        |                    | Capacity | E. coli (billion                        |   |
| number | KPDES#       | Facility Name     | Type               | (cfs)    | colonies/day)                           |   |
|        |              |                   | Dwelling           |          |   |   |
|        |              | FRASURE           | Other than         |          |   | KPDES                                   |
| 4344   | KYG401121    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
|        |              |                   | Dwelling           |          |   |   |
|        |              | CRUM              | Other than         |          |   | KPDES                                   |
| 4336   | KYG401125    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 1000   |              |                   | Dwelling           |          | *************************************** | .,,                                     |
|        |              | SHEPPARD          | Other than         |          |   | KPDES                                   |
| 12253  | KYG401218    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
|        |              |                   | Dwelling           |          | 0,000                                   | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
|        |              | WEBB              | Other than         |          |   | KPDES                                   |
| 15655  | KYG401296    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 15055  | 111 0 1012)0 | RESIDENCE         | Dwelling           | 0.000771 | 0.0015                                  | VV EAR                                  |
|        |              | EVERIDGE          | Other than         |          |   | KPDES                                   |
| 15807  | KYG401352    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 13007  | K10401332    | RESIDENCE         | Dwelling           | 0.000774 | 0.0045                                  | VV E/IX                                 |
|        |              | WILLIAMSON        | Other than         |          |   | KPDES                                   |
| 33378  | KYG401353    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 33376  | K10401333    | RESIDENCE         | Dwelling           | 0.000774 | 0.0043                                  | WLA                                     |
|        |              | HALL              | Other than         |          |   | KPDES                                   |
| 74185  | KYG401475    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 77103  | K104014/3    | RESIDENCE         | Dwelling           | 0.000774 | 0.0043                                  | WLA                                     |
|        |              | WALLACE           | Other than         |          |   | KPDES                                   |
| 43120  | KYG401540    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 43120  | K10401340    | RESIDENCE         | Dwelling           | 0.000774 | 0.0043                                  | WLA                                     |
|        |              | PRATER            | Other than         |          |   | KPDES                                   |
| 43224  | KYG401548    | RESIDENCE         |                    | 0.000774 | 0.0045                                  | WLA                                     |
| 43224  | K10401346    | RESIDENCE         | Apartment Dwelling | 0.000774 | 0.0045                                  | WLA                                     |
|        |              | CHILDERS          | Other than         |          |   | KPDES                                   |
| 46147  | KYG401603    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 40147  | K10401003    | RESIDENCE         | Dwelling           | 0.000774 | 0.0045                                  | WLA                                     |
|        |              | LAFERTY           | Other than         |          |   | KPDES                                   |
| 47022  | KYG401638    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 4/022  | K10401036    | RESIDENCE         | Dwelling           | 0.000774 | 0.0043                                  | WLA                                     |
|        |              | SCOTT             | Other than         |          |   | KPDES                                   |
| 50627  | KYG401721    | B B G I B B I G B |                    | 0.000774 | 0.0045                                  |   |
| 30027  | K10401/21    | RESIDENCE         | Apartment Dwelling | 0.000774 | 0.0043                                  | WLA                                     |
|        |              | KIDD              | Other than         |          |   | KPDES                                   |
| 50950  | KYG401730    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 30930  | K10401/30    | RESIDENCE         | Dwelling           | 0.000774 | 0.0043                                  | WLA                                     |
|        |              | ISON              | Other than         |          |   | KPDES                                   |
| 54879  | KYG401772    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 34013  | K10401//2    | RESIDENCE         | Dwelling           | 0.000774 | 0.0043                                  | WLA                                     |
|        |              | HOWARD            | Other than         |          |   | KPDES                                   |
| 75556  | KYG401857    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 13330  | K1040103/    | RESIDENCE         | Dwelling           | 0.000774 | 0.0043                                  | WLA                                     |
|        |              | BILITER           | Other than         |          |   | KPDES                                   |
| 76078  | KYG401876    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |
| 70078  | K10401070    | RESIDENCE         | Dwelling           | 0.000774 | 0.0043                                  | WLA                                     |
|        |              | SCARBERRY         | Other than         |          |   | KPDES                                   |
| 81570  | KYG401981    | RESIDENCE         | Apartment          | 0.000774 | 0.0045                                  |   |
| 013/0  | K10401981    | KESIDENCE         | Apartment          | 0.000774 | 0.0045                                  | WLA                                     |

Final
Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

September, 2010

| AI     |           | Discharger    |             | Design<br>Capacity | E. coli (billion |           |
|--------|-----------|---------------|-------------|--------------------|------------------|-----------|
| number | KPDES#    | Facility Name | Туре        | (cfs)              | colonies/day)    |           |
|        |           |               | Dwelling    |                    |                  |           |
|        |           | COOK          | Other than  |                    |                  | KPDES     |
| 84292  | KYG402025 | RESIDENCE     | Apartment   | 0.000774           | 0.0045           | WLA       |
|        |           |               | Dwelling    |                    |                  |           |
|        |           | PRATER        | Other than  |                    |                  | KPDES     |
| 97291  | KYG402063 | RESIDENCE     | Apartment   | 0.000774           | 0.0045           | WLA       |
|        |           |               |             |                    |                  | Total     |
|        |           |               |             |                    |                  | KPDES     |
|        |           |               |             |                    | 2.8118           | WLA       |
|        |           |               | Addition to |                    |                  |           |
|        |           |               | MAF (sum of |                    |                  |           |
|        |           |               | cfs)        | 0.478867           | 1080.2555        | remainder |
|        |           |               |             |                    |                  | Future    |
|        |           |               |             |                    |                  | Growth    |
|        |           |               |             |                    | 10.8026          | WLA       |
|        |           |               |             |                    | 13.6144          | Total WLA |
|        |           |               |             |                    |                  |           |
|        |           |               |             |                    | 1069.4529        | LA        |

#### data is distributed by the Commonwealth of Kentucky, of Geographic Information (DGI), located in Frankfort, KY This data is available at http://kygeonet.ky.gov Kentucku 6/28/10 COAL RUN VILLAGE Leaend Legend Cities Open Water Streams Developed, Open Space E. coli Sample Sites Developed, Low Intensity Right Fork Beaver 0.0 to 17.4 Developed, Medium Intensity Right Fork Beaver 17.4 to 23.3 Developed, High Intensity Right Fork Beaver 23.3 to 30.3 Barren Land (Rock,Sand,Clay) Deciduous Forest Right Fork Beaver 30.3 to 33.4 Evergreen Forest Caney ForK 0.0 to 7.5 Mixed Forest Jones Fork 0.0 to 9.9 Shrub/Scrub Rock Fork 0.0 to 7.0 Grasslands/Herbaceous Salt Lick 0.0 to 6.8 Pasture/Hav Turkey Creek 0.0 to 5.9 Cultivated Crops Woody Wetlands Elk Release Site Emergent Herbaceous Wetlands Wildlife Management Area KPDES-permitted Sources Dwelling other than Apartment IAGOFFIN Bituminous Coal & Lig, Surface HEELWRIGHT Department Stores FLOYD Elementary & Secondary Schools ★ Intermediate Care Facilities Mobile Home Apartment Building PIKE Sewerage Systems

# Right Fork Beaver Creek Site 34

Figure E.6 Right Fork Beaver Creek Site 34

Hospital

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 27 is under site 35, site 20 is under site 31, site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Right Fork Beaver Creek at site 34 (RM 11.2) is a fourth order stream located in Floyd County (Figure E.6). Its watershed consists of the Upper, Middle, and part of the Lower Right Fork Beaver Creek subwatersheds and extends from Knott into Floyd County. Information about Right Fork Beaver Creek at site 34, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.26. It has a catchment of 80,698 acres (126 square miles) with an 80% forested and 5.7% developed land cover (Table E.27). There are several wildlife management areas and an elk release site in this subwatershed (Figure E.6). Portions of this watershed are sewered; especially in larger cities (see Figures 5.17 and 5.18). There are three stream water withdrawals in this subwatershed (Table E.28). Sampling data from site 34 is presented in Table E.29, and the TMDL allocations in Table E.30.

Table E.26 Right Fork Beaver Creek Site 34 Information

| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |        |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|--------|----------|
|        | Right             |           | j        |           |                 |               |         |        |          |
|        | Fork              |           |          |           |                 |               |         |        |          |
| Right  | Beaver            |           |          |           |                 |               |         |        |          |
| Fork   | Creek             |           |          |           |                 |               |         |        |          |
| Beaver | 0.0 to            |           |          |           |                 |               |         |        |          |
| Creek  | 17.4              | 501863_01 | Floyd    | 80698.02  | 126.091         | 4th order     |         |        |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF    | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)  | (cfs)    |
| 34     | 34                | 11.2      | 37.5129  | -82.8362  | 169.3           | 11.2          | 0.35818 | 1.4312 | 168.227  |

Table E.27 Right Fork Beaver Creek Site 34 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 74.66     | 0.12         | 0.09       |               |
| Developed            | 4630.09   | 7.23         | 5.74       | 1             |
| Barren Land          | 1105.21   | 1.73         | 1.37       |               |
| Forest/Shrubland     | 64664.64  | 101.04       | 80.13      |               |
| Grassland/Herbaceous | 8293.16   | 12.96        | 10.28      |               |
| Pasture/ Hay         | 1828.19   | 2.86         | 2.27       |               |
| Cultivated Crops     | 92.71     | 0.14         | 0.11       |               |
| Wetlands             | 9.36      | 0.01         | 0.01       |               |
| Totals               | 80698.02  | 126.09       | 100.00     |               |

Table E.28 Right Fork Beaver Creek Site 34 Water Withdrawals

| AI<br>number | Source<br>Description | Withdrawal Facility Name | Withdrawal, cfs | Facility<br>Latitude | Facility<br>Longitude |
|--------------|-----------------------|--------------------------|-----------------|----------------------|-----------------------|
|              | RM 40.6               |                          |                 |                      | _                     |
|              | Right Fork            |                          |                 |                      |                       |
|              | Beaver                | ICG Knott Co LLC         |                 |                      |                       |
| 2528         | Creek                 | (860-8012)               | 0.4100156       | 37.32166             | -82.80366             |
|              | RM 31.0               |                          |                 |                      |                       |
|              | Right Fork            |                          |                 |                      |                       |
|              | Beaver                | Deane Mining LLC         |                 |                      |                       |
| 2525         | Creek                 | (860-5318)               | 0.01547229      | 37.41038             | -82.78096             |
|              | RM 4.2 of             |                          |                 |                      |                       |
|              | Caney                 |                          |                 |                      |                       |
| 3502         | Creek                 | ICG Knott Co LLC         | 1.005699        | 37.3884              | -82.82856             |
|              |                       | subtraction from         |                 |                      |                       |
|              |                       | MAF                      | 1.43118689      |                      |                       |

Table E.29 Right Fork Beaver Creek Site 34 Data

|                        | D 1           |        | Instantaneous          | TT '. A T 1                     |
|------------------------|---------------|--------|------------------------|---------------------------------|
|                        | E. coli       | 771    | Load (billion          | Unit Area Load                  |
|                        | (colonies/100 | Flow   | <u>E</u> . <u>coli</u> | (million <u>E</u> . <u>coli</u> |
| Collection Date        | mls)          | (cfs)  | colonies/day)          | colonies/day/acre)              |
| 05/15/07               | 80            | 18.505 | 36.22                  | 0.45                            |
| 05/30/07               | 290           | 24.19  | 171.63                 | 2.13                            |
| 06/13/07               | 390           | 18.952 | 180.83                 | 2.24                            |
| 06/27/07               | 5900          | 21.113 | 3047.62                | 37.77                           |
| 07/10/07               | 300           | 9.207  | 67.58                  | 0.84                            |
| 07/26/07               | 5100          | 69.501 | 8672.01                | 107.46                          |
| 08/17/07               | 150           | 7.962  | 29.22                  | 0.36                            |
| 08/31/07               | 130           | N/A    | N/A                    | N/A                             |
| 09/14/07               | 210           | 3.97   | 20.40                  | 0.25                            |
| 09/28/07               | 100           | 1.933  | 4.73                   | 0.06                            |
| 10/12/07               | 120           | 3.6554 | 10.73                  | 0.13                            |
| 11/17/07 (outside PCR  |               |        |                        |                                 |
| season)                | 3300          | 19.807 | 1599.16                | 19.82                           |
| 11/17/07 (QA Sample)   | 2100          | N/A    | N/A                    | N/A                             |
| Greatest Concentration | 5900          |        |                        |                                 |

Table E.30 TMDLs for Right Fork Beaver Creek Site 34

|        |           | ragin rom beaver    |               |           |                     |             |
|--------|-----------|---------------------|---------------|-----------|---------------------|-------------|
| TMDL   |           |                     |               |           | E. coli<br>(billion |             |
| Table  |           |                     |               |           | colonies/day)       |             |
|        |           |                     |               |           |                     | Existing    |
|        |           |                     |               |           | 24283.2262          | Load        |
|        |           |                     |               |           |                     | Total       |
|        |           |                     |               |           | 987.7923            | TMDL        |
|        |           |                     |               |           | 98.7792             | MOS         |
|        |           |                     |               |           |                     | TMDL        |
|        |           |                     |               |           | 889.0130            | Target      |
|        |           |                     |               | Design    |                     |             |
| AI     |           | Discharger Facility |               | Capacity  |                     |             |
| number | KPDES#    | Name                | Type          | (cfs)     | 96.34               | % reduction |
|        |           | KNOTT CO            |               |           |                     |             |
|        |           | WATER & SEWER       | Sewerage      |           |                     | KPDES       |
| 2527   | KY0042854 | DIST                | System        | 0.1547229 | 0.9085              | WLA         |
|        |           | BEAVER CREEK        |               |           |                     | KPDES       |
| 33945  | KY0077542 | ELEM SCHOOL         | School        | 0.0108306 | 0.0636              | WLA         |
|        |           | GOLDEN YEARS        | Intermediate  |           |                     | KPDES       |
| 2517   | KY0083089 | REST HOME           | Care Facility | 0.0154723 | 0.0908              | WLA         |
|        |           | JONES FORK          |               |           |                     | KPDES       |
| 35359  | KY0087076 | ELEM SCHOOL         | School        | 0.0092834 | 0.0545              | WLA         |
|        |           |                     | Bituminous    |           |                     |             |
|        |           | CONSOL OF KY        | Coal & Lig,   |           |                     | KPDES       |
| 2514   | KY0094510 | INC JONES FORK      | Surface       | 0.0046417 | 0.0273              | WLA         |

|              |               |                          |                        | Design         | E. coli                |              |
|--------------|---------------|--------------------------|------------------------|----------------|------------------------|--------------|
| AI<br>number | KPDES#        | Discharger Facility Name | Туре                   | Capacity (cfs) | (billion colonies/day) |              |
| Hullibel     | KFDES#        | Iname                    | Sewerage               | (CIS)          | colonies/day)          | KPDES        |
| 35761        | KY0105228     | WAYLAND STP              | System                 | 0.1547229      | 0.9085                 | WLA          |
| 33701        | 1110100220    | WITEINDOIL               | Dwelling               | 0.10 17229     | 0.7000                 | VV 231 X     |
|              |               | GREEN                    | Other than             |                |                        | KPDES        |
| 1199         | KYG400603     | RESIDENCE                | Apartment              | 0.0007736      | 0.0045                 | WLA          |
|              |               |                          | Dwelling               |                |                        |              |
|              |               | PERKINS                  | Other than             |                |                        | KPDES        |
| 1293         | KYG400836     | RESIDENCE                | Apartment              | 0.0007736      | 0.0045                 | WLA          |
|              |               |                          | Dwelling               |                |                        |              |
|              |               | SHEPHERD                 | Other than             |                |                        | KPDES        |
| 1314         | KYG400844     | RESIDENCE                | Apartment              | 0.0007736      | 0.0045                 | WLA          |
|              |               | MEGMER                   | Dwelling               |                |                        |              |
| 10.40        | WWG 400015    | KESTER                   | Other than             | 0.0007726      | 0.0045                 | KPDES        |
| 1243         | KYG400915     | RESIDENCE                | Apartment              | 0.0007736      | 0.0045                 | WLA          |
|              |               | CACTLE                   | Dwelling<br>Other than |                |                        | LDDEC        |
| 4350         | KYG401113     | CASTLE<br>RESIDENCE      | Apartment              | 0.0007736      | 0.0045                 | KPDES<br>WLA |
| 4330         | K10401113     | RESIDENCE                | Dwelling               | 0.0007730      | 0.0045                 | WLA          |
|              |               | CRUM                     | Other than             |                |                        | KPDES        |
| 4336         | KYG401125     | RESIDENCE                | Apartment              | 0.0007736      | 0.0045                 | WLA          |
| 1330         | K10101123     | RESIDEIVEE               | Dwelling               | 0.0007730      | 0.0015                 | VV EZE       |
|              |               |                          | Other than             |                |                        | KPDES        |
| 15655        | KYG401296     | WEBB RESIDENCE           | Apartment              | 0.0007736      | 0.0045                 | WLA          |
|              |               |                          | Dwelling               |                |                        |              |
|              |               |                          | Other than             |                |                        | KPDES        |
| 74185        | KYG401475     | HALL RESIDENCE           | Apartment              | 0.0007736      | 0.0045                 | WLA          |
|              |               |                          | Dwelling               |                |                        |              |
|              |               | WALLACE                  | Other than             |                |                        | KPDES        |
| 43120        | KYG401540     | RESIDENCE                | Apartment              | 0.0007736      | 0.0045                 | WLA          |
|              |               | CHILDEDG                 | Dwelling               |                |                        | LIDDEG       |
| 46147        | IZVC401702    | CHILDERS                 | Other than             | 0.0007726      | 0.0045                 | KPDES        |
| 46147        | KYG401603     | RESIDENCE                | Apartment              | 0.0007736      | 0.0045                 | WLA          |
|              |               |                          | Dwelling<br>Other than |                |                        | KPDES        |
| 50950        | KYG401730     | KIDD RESIDENCE           | Apartment              | 0.0007736      | 0.0045                 | WLA          |
| 30730        | 11 3 101 / 30 | THE RESIDENCE            | 1 ipartificit          | 0.0007730      | 0.0073                 | Total        |
|              |               |                          |                        |                |                        | KPDES        |
|              |               |                          |                        |                | 2.1032                 | WLA          |
|              |               |                          | Addition to            |                |                        |              |
|              |               |                          | MAF (sum               |                |                        |              |
|              |               |                          | of cfs)                | 0.3581835      | 886.9099               | remainder    |
|              |               |                          |                        |                |                        | Future       |
|              |               |                          |                        |                |                        | Growth       |
|              |               |                          |                        |                | 8.8691                 | WLA          |
|              |               |                          |                        |                | 10.9723                | Total WLA    |
|              |               |                          |                        |                | 878.0408               | LA           |

# Right Fork Beaver Creek Site 35

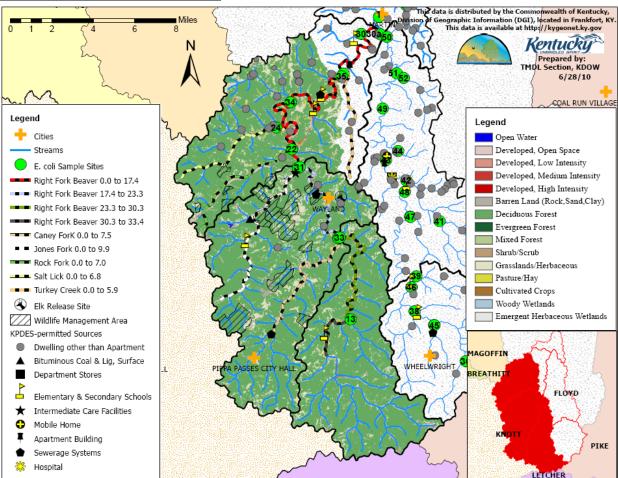


Figure E.7 Right Fork Beaver Creek Site 35

Note: Due to map resolution, some sites are masked by symbols for other sites. 27 is under site 35, site 20 is under site 31, site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Right Fork Beaver Creek at site 35 (RM 5.7) is a fourth order stream located in Floyd County (Figure E.7). Its watershed consists of the Upper, Middle, and part of the Lower Right Fork Beaver Creek subwatersheds and extends from Knott into Floyd County. Information about Right Fork Beaver Creek at site 35, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.31. It has a catchment of 90,610 acres (142 square miles) with a 79% forested and 5.8% developed land cover (Table E.32). There are several wildlife management areas and an elk release site in this subwatershed (Figure E.7). Portions of this watershed are sewered; especially in larger cities (see Figures 5.17 and 5.18). There are three stream water withdrawals in this subwatershed (Table E.33). Sampling data from site 35 is presented in Table E.34, and the TMDL allocations in Table E.35.

Table E.31 Right Fork Beaver Creek Site 35 Information

|        | Stream  |           |          |           | Square  |               |        |        |          |
|--------|---------|-----------|----------|-----------|---------|---------------|--------|--------|----------|
| Stream | Segment | WBID#     | County   | Acres     | Miles   | Stream Order  |        |        |          |
|        | Right   |           |          |           |         |               |        |        |          |
|        | Fork    |           |          |           |         |               |        |        |          |
| Right  | Beaver  |           |          |           |         |               |        |        |          |
| Fork   | Creek   |           |          |           |         |               |        |        |          |
| Beaver | 0.0 to  |           |          |           |         |               |        |        |          |
| Creek  | 17.4    | 501863_01 | Floyd    | 90610.36  | 141.579 | 4th order     |        |        |          |
|        |         |           |          |           |         |               |        |        |          |
|        |         |           | Sample   | Sample    |         |               | + to   | - from | Adjusted |
| EKU    | MAP     | Sample    | Site     | Site      | MAF     | RM of MAF     | MAF    | MAF    | MAF      |
| Site # | Site #  | Point RM  | Latitude | Longitude | (cfs)   | Determination | (cfs)  | (cfs)  | (cfs)    |
| 35     | 35      | 5.7       | 37.52986 | -82.79064 | 189.1   | 5.7           | 0.4355 | 1.4312 | 188.104  |

Table E.32 Right Fork Beaver Creek Site 35 Subwatershed Land Cover

| 8                    | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 75.30     | 0.12         | 0.08       |               |
| Developed            | 5288.83   | 8.26         | 5.84       | 1             |
| Barren Land          | 1164.43   | 1.82         | 1.29       |               |
| Forest/Shrubland     | 71603.88  | 111.88       | 79.02      |               |
| Grassland/Herbaceous | 9868.36   | 15.42        | 10.89      |               |
| Pasture/ Hay         | 2472.33   | 3.86         | 2.73       |               |
| Cultivated Crops     | 124.98    | 0.20         | 0.14       |               |
| Wetlands             | 12.25     | 0.02         | 0.01       |               |
| Totals               | 90610.36  | 141.58       | 100.00     |               |

Table E.33 Right Fork Beaver Creek Site 35 Water Withdrawals

| AI<br>number | Source<br>Description                    | Withdrawal Facility<br>Name     | Withdrawal, cfs | Facility<br>Latitude | Facility<br>Longitude |
|--------------|--|---------------------------------|-----------------|----------------------|-----------------------|
| 2528         | RM 40.6<br>Right Fork<br>Beaver<br>Creek | ICG Knott Co LLC (860-<br>8012) | 0.4100156       | 37.32166             | -82.80366             |
| 2525         | RM 31.0<br>Right Fork<br>Beaver<br>Creek | Deane Mining LLC (860-5318)     | 0.01547229      | 37.41038             | -82.78096             |
| 3502         | RM 4.2 of<br>Caney<br>Creek              | ICG Knott Co LLC                | 1.005699        | 37.3884              | -82.82856             |
|              |  | subtraction from MAF            | 1.43118689      |                      |                       |

Table E.34 Right Fork Beaver Creek Site 35 Data

| Ţ,                            | E. coli<br>(colonies/100 | Flow   | Instantaneous<br>Load (billion E. | Unit Area Load (million <u>E</u> . <u>coli</u> |
|-------------------------------|--------------------------|--------|-----------------------------------|--|
| Collection Date               | mls)                     | (cfs)  | <u>coli</u> colonies/day)         | colonies/day/acre)                             |
| 05/16/07                      | 140                      | N/A    | N/A                               | N/A  |
| 05/30/07                      | 190                      | 27.832 | 129.38                            | 1.43   |
| 06/13/07                      | 340                      | N/A    | N/A                               | N/A  |
| 06/27/07                      | 3500                     | N/A    | N/A                               | N/A  |
| 6/27/07 (QA Sample)           | 2400                     | N/A    | N/A                               | N/A  |
| 07/10/07                      | 50                       | N/A    | N/A                               | N/A  |
| 07/26/07                      | 6700                     | N/A    | N/A                               | N/A  |
| 7/26/07 (QA Sample)           | 1100                     | N/A    | N/A                               | N/A  |
| 08/17/07                      | 170                      | 6.893  | 28.67                             | 0.32   |
| 08/31/07                      | 70                       | N/A    | N/A                               | N/A  |
| 09/14/07                      | 310                      | N/A    | N/A                               | N/A  |
| 09/28/07                      | 640                      | N/A    | N/A                               | N/A  |
| 10/12/07                      | 310                      | 2.925  | 22.18                             | 0.24   |
| 11/17/07 (outside PCR         |                          |        |                                   |  |
| season)                       | 2600                     | N/A    | N/A                               | N/A  |
| <b>Greatest Concentration</b> | 6700                     |        |                                   |  |

Table E.35 TMDLs for Right Fork Beaver Creek Site 35

| TMDL   |           |                                   |                               |                    | E. coli (billion |               |
|--------|-----------|-----------------------------------|-------------------------------|--------------------|------------------|---------------|
| Table  |           |                                   |                               |                    | colonies/day)    |               |
|        |           |                                   |                               |                    | 30834.1757       | Existing Load |
|        |           |                                   |                               |                    | 1104.5078        | Total TMDL    |
|        |           |                                   |                               |                    | 110.4508         | MOS           |
|        |           |                                   |                               |                    | 994.0570         | TMDL Target   |
| AI     |           | Discharger                        |                               | Design<br>Capacity |                  |               |
| number | KPDES#    | Facility Name                     | Type                          | (cfs)              | 96.78            | % reduction   |
| 2527   | KY0042854 | KNOTT CO<br>WATER &<br>SEWER DIST | Sewerage<br>System            | 0.154723           | 0.9085           | KPDES<br>WLA  |
| 33945  | KY0077542 | BEAVER<br>CREEK ELEM<br>SCHOOL    | School                        | 0.010831           | 0.0636           | KPDES<br>WLA  |
| 35254  | KY0079430 | ALLEN CENTRAL HIGH SCHOOL         | School                        | 0.01702            | 0.0999           | KPDES<br>WLA  |
| 2517   | KY0083089 | GOLDEN<br>YEARS REST<br>HOME      | Intermediate<br>Care facility | 0.015472           | 0.0908           | KPDES<br>WLA  |
| 35359  | KY0087076 | JONES FORK<br>ELEM SCHOOL         | School                        | 0.009283           | 0.0545           | KPDES<br>WLA  |
| 35258  | KY0093017 | JAMES A DUFF<br>ELEM SCHOOL       | School                        | 0.012378           | 0.0727           | KPDES<br>WLA  |

| AI     |                   | Discharger           |                         | Design<br>Capacity | E. coli (billion |              |
|--------|-------------------|----------------------|-------------------------|--------------------|------------------|--------------|
| number | KPDES#            | Facility Name        | Туре                    | (cfs)              | colonies/day)    |              |
|        |                   | CONSOL OF KY         | Bituminous              |                    |                  |              |
|        |                   | INC JONES            | Coal & Lig,             |                    |                  | KPDES        |
| 2514   | KY0094510         | FORK                 | Surface                 | 0.004642           | 0.0273           | WLA          |
| 25761  | 1/3/0105220       | WANT AND OTD         | Sewerage                | 0.154700           | 0.0005           | KPDES        |
| 35761  | KY0105228         | WAYLAND STP          | System                  | 0.154723           | 0.9085           | WLA          |
| 35260  | KY0107051         | EASTERN STP          | Sewerage                | 0.038681           | 0.2271           | KPDES<br>WLA |
| 33200  | K1010/031         | EASIEKN SIP          | System  Dwelling        | 0.038081           | 0.22/1           | WLA          |
|        |                   | GOBLE                | Other than              |                    |                  | KPDES        |
| 1196   | KYG400590         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
| 1170   | 1110100000        | REGIDENCE            | Dwelling                | 0.000771           | 0.0013           | VV 257 1     |
|        |                   | GREEN                | Other than              |                    |                  | KPDES        |
| 1199   | KYG400603         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
|        |                   |                      | Dwelling                |                    |                  |              |
|        |                   | MITCHELL             | Other than              |                    |                  | KPDES        |
| 1270   | KYG400666         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
|        |                   |                      | Dwelling                |                    |                  |              |
| 100-   | *****             | HOOVER               | Other than              | 0.000==            |                  | KPDES        |
| 1222   | KYG400730         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
|        |                   | DEDICALO             | Dwelling                |                    |                  | LADDEC       |
| 1202   | VVC400026         | PERKINS              | Other than              | 0.000774           | 0.0045           | KPDES        |
| 1293   | KYG400836         | RESIDENCE            | Apartment Dwelling      | 0.000774           | 0.0045           | WLA          |
|        |                   | SHEPHERD             | Other than              |                    |                  | KPDES        |
| 1314   | KYG400844         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
| 1317   | K1 0400044        | RESIDENCE            | Dwelling                | 0.000774           | 0.0043           | WLA          |
|        |                   | KESTER               | Other than              |                    |                  | KPDES        |
| 1243   | KYG400915         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
|        |                   |                      | Dwelling                |                    |                  |              |
|        |                   | MAY                  | Other than              |                    |                  | KPDES        |
| 4327   | KYG401073         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
|        |                   |                      | Dwelling                |                    |                  |              |
|        |                   | CASTLE               | Other than              |                    |                  | KPDES        |
| 4350   | KYG401113         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
|        |                   | ED A CLIDE           | Dwelling                |                    |                  | LADDEC       |
| 4344   | KYG401121         | FRASURE<br>RESIDENCE | Other than<br>Apartment | 0.000774           | 0.0045           | KPDES<br>WLA |
| 7344   | K10401121         | RESIDENCE            | Dwelling                | 0.000774           | 0.0043           | WLA          |
|        |                   | CRUM                 | Other than              |                    |                  | KPDES        |
| 4336   | KYG401125         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
| .550   |                   |                      | Dwelling                |                    |                  | ,, 222       |
|        |                   | SHEPPARD             | Other than              |                    |                  | KPDES        |
| 12253  | KYG401218         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
|        |                   |                      | Dwelling                |                    |                  |              |
|        |                   | WEBB                 | Other than              |                    |                  | KPDES        |
| 15655  | KYG401296         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
|        |                   | EVEDID CE            | Dwelling                |                    |                  | LIDDEC       |
| 15007  | VVC401252         | EVERIDGE             | Other than              | 0.000774           | 0.0045           | KPDES        |
| 15807  | KYG401352         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
|        |                   | WILLIAMSON           | Dwelling<br>Other than  |                    |                  | KPDES        |
| 33378  | KYG401353         | RESIDENCE            | Apartment               | 0.000774           | 0.0045           | WLA          |
| 33310  | IX 1 O TO 1 3 3 3 | KLOIDENCE            | Apartment               | 0.000774           | 0.0043           | VLA          |

|            |              |                   |             | Design   |                  |           |
|------------|--------------|-------------------|-------------|----------|------------------|-----------|
| AI         |              | Discharger        |             | Capacity | E. coli (billion |           |
| number     | KPDES#       | Facility Name     | Type        | (cfs)    | colonies/day)    |           |
| 1101110 01 | TELDED II    | 1 welling 1 wille | Dwelling    | (515)    | coronies, day)   |           |
|            |              | HALL              | Other than  |          |                  | KPDES     |
| 74185      | KYG401475    | RESIDENCE         | Apartment   | 0.000774 | 0.0045           | WLA       |
| 71100      | 1113101175   | RESIDENCE         | Dwelling    | 0.000771 | 0.0015           | VV EST    |
|            |              | WALLACE           | Other than  |          |                  | KPDES     |
| 43120      | KYG401540    | RESIDENCE         | Apartment   | 0.000774 | 0.0045           | WLA       |
| 73120      | K10401340    | RESIDENCE         | Dwelling    | 0.000774 | 0.0043           | WLA       |
|            |              | PRATER            | Other than  |          |                  | KPDES     |
| 43224      | KYG401548    | RESIDENCE         | Apartment   | 0.000774 | 0.0045           | WLA       |
| 43224      | K10401346    | RESIDENCE         | Dwelling    | 0.000774 | 0.0043           | WLA       |
|            |              | CHILDERS          | Other than  |          |                  | KPDES     |
| 46147      | KYG401603    | RESIDENCE         | Apartment   | 0.000774 | 0.0045           |           |
| 40147      | K1U401003    | RESIDENCE         |             | 0.000774 | 0.0045           | WLA       |
|            |              | IZIDD             | Dwelling    |          |                  | LADDEC    |
| 50050      | 17370 401720 | KIDD              | Other than  | 0.000774 | 0.0045           | KPDES     |
| 50950      | KYG401730    | RESIDENCE         | Apartment   | 0.000774 | 0.0045           | WLA       |
|            |              | HOWARD            | Dwelling    |          |                  |           |
|            | ******       | HOWARD            | Other than  |          |                  | KPDES     |
| 75556      | KYG401857    | RESIDENCE         | Apartment   | 0.000774 | 0.0045           | WLA       |
|            |              |                   | Dwelling    |          |                  |           |
|            |              | BILITER           | Other than  |          |                  | KPDES     |
| 76078      | KYG401876    | RESIDENCE         | Apartment   | 0.000774 | 0.0045           | WLA       |
|            |              |                   | Dwelling    |          |                  |           |
|            |              | PRATER            | Other than  |          |                  | KPDES     |
| 97291      | KYG402063    | RESIDENCE         | Apartment   | 0.000774 | 0.0045           | WLA       |
|            |              |                   |             |          |                  | Total     |
|            |              |                   |             |          |                  | KPDES     |
|            |              |                   |             |          | 2.5574           | WLA       |
|            |              |                   | Addition to |          |                  |           |
|            |              |                   | MAF (sum    |          |                  |           |
|            |              |                   | of cfs)     | 0.435545 | 991.4996         | remainder |
|            |              |                   |             |          |                  | Future    |
|            |              |                   |             |          |                  | Growth    |
|            |              |                   |             |          | 9.9150           | WLA       |
|            |              |                   |             |          | 12.4724          | Total WLA |
|            |              |                   |             |          | 981.5846         | LA        |

#### **Frasure Creek Site 41**

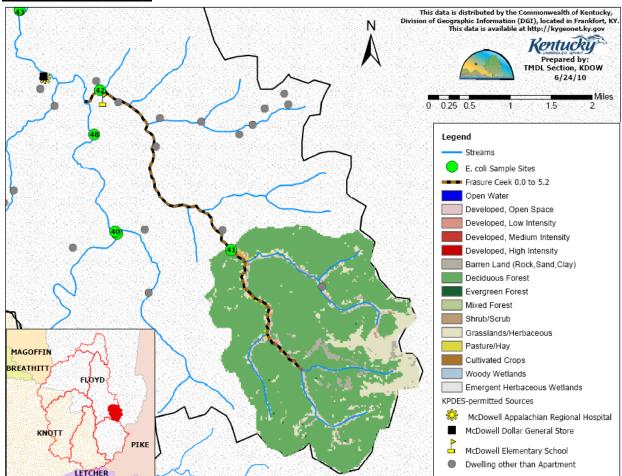


Figure E.8 Frasure Creek Site 41

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 47 is under site 40.

Frasure Creek at site 41 (RM 3.25) is a third order stream located in the Lower Left Fork Beaver Creek subwatershed in Floyd County (Figure E.8). Information about Frasure Creek at site 41, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.36. It has a catchment of 3,494 acres (5.5 square miles) with an 82% forested and 3.2% developed land cover (Table E.37). This watershed is un-sewered. There are no water withdrawals in this subwatershed. Sampling data from site 41 is presented in Table E.38, and the TMDL allocations in Table E.39.

Table E.36 Frasure Creek Site 41 Information

| Stream  | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |       |          |
|---------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|-------|----------|
|         | Frasure           |           |          |           |                 |               |         |       |          |
|         | Creek             |           |          |           |                 |               |         |       |          |
| Frasure | 0.0 to            |           |          |           |                 |               |         |       |          |
| Creek   | 5.2               | 492466_01 | Floyd    | 3494.33   | 5.46            | 3rd order     |         |       |          |
|         |                   |           |          |           |                 |               |         | _     |          |
|         |                   |           | Sample   | Sample    |                 |               | + to    | from  | Adjusted |
| EKU     | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF   | MAF      |
| Site #  | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs) | (cfs)    |
| 41      | 41                | 3.25      | 37.42650 | -82.70880 | 7.6             | 3.25          | 0.00077 | 0     | 7.6008   |

Table E.37 Frasure Creek Site 41 Subwatershed Land Cover

| Land Cover           | Watershed<br>Acres | Watershed<br>Square<br>Miles | % of Total<br>Area | Future<br>Growth<br>WLA % |
|----------------------|--------------------|------------------------------|--------------------|---------------------------|
| Open Water           | 0.00               | 0.00                         | 0.00               |                           |
| Developed            | 119.59             | 0.19                         | 3.42               | 0.5                       |
| Barren Land          | 93.09              | 0.15                         | 2.66               |                           |
| Forest/Shrubland     | 2853.19            | 4.46                         | 81.65              |                           |
| Grassland/Herbaceous | 411.10             | 0.64                         | 11.76              |                           |
| Pasture/ Hay         | 16.70              | 0.03                         | 0.48               |                           |
| Cultivated Crops     | 0.67               | 0.00                         | 0.02               |                           |
| Wetlands             | 0.00               | 0.00                         | 0.00               |                           |
| Totals               | 3494.33            | 5.46                         | 100.00             |                           |

Table E.38 Frasure Creek Site 41 Data

|                    |               |         | Instantaneous          |                                 |
|--------------------|---------------|---------|------------------------|---------------------------------|
|                    | E. coli       |         | Load (billion          | Unit Area Load                  |
|                    | (colonies/100 | Flow    | <u>E</u> . <u>coli</u> | (million <u>E</u> . <u>coli</u> |
| Collection Date    | mls)          | (cfs)   | colonies/day)          | colonies/day/acre)              |
| 05/16/08           | 2000          | N/A     | N/A                    | N/A                             |
| 05/30/08           | 1600          | 0.9202  | 36.02                  | 10.31                           |
| 06/13/08           | 170           | 0.3155  | 1.31                   | 0.38                            |
| 06/27/08           | 450           | 0.29    | 3.19                   | 0.91                            |
| 07/31/08           | 71000         | 18.8592 | 32759.73               | 9375.11                         |
| 08/08/08           | 1700          | 0.474   | 19.71                  | 5.64                            |
| 8/8/08 (QA Sample) | 360           | N/A     | N/A                    | N/A                             |
| 09/12/08           | 13000         | 0.7636  | 242.87                 | 69.50                           |
| 09/20/08           | 1000          | 0.391   | 9.57                   | 2.74                            |
| Greatest           |               |         |                        |                                 |
| Concentration      | 71000         |         |                        |                                 |

Table E.39 TMDLs for Frasure Creek Site 41

| Table L.3 | 7 TIVIDES IOI I | Tasuic Cicck Site 4 | 1          |           |                                    |           |
|-----------|-----------------|---------------------|------------|-----------|------------------------------------|-----------|
| TMDL      |                 |                     |            |           | <u>E</u> . <u>coli</u><br>(billion |           |
| Table     |                 |                     |            |           | colonies/day)                      |           |
|           |                 |                     |            |           |                                    | Existing  |
| Site 41   |                 |                     |            |           | 13203.0671                         | Load      |
|           |                 |                     |            |           |                                    | Total     |
|           |                 |                     |            |           | 44.6301                            | TMDL      |
|           |                 |                     |            |           | 4.4630                             | MOS       |
|           |                 |                     |            |           |                                    | TMDL      |
|           |                 |                     |            |           | 40.1671                            | Target    |
|           |                 |                     |            | Design    |                                    |           |
| AI        |                 | Discharger          |            | Capacity  |                                    | %         |
| number    | KPDES#          | Facility Name       | Type       | (cfs)     | 99.70                              | reduction |
|           |                 |                     | Dwelling   |           |                                    |           |
|           |                 | BLANKENSHIP         | Other than |           |                                    | KPDES     |
| 50021     | KYG401692       | RESIDENCE           | Apartment  | 0.0007736 | 0.0045                             | WLA       |
|           |                 |                     | Addition   |           |                                    |           |
|           |                 |                     | to MAF     |           |                                    |           |
|           |                 |                     | (sum of    |           |                                    |           |
|           |                 |                     | cfs)       | 0.0007736 | 40.1625                            | remainder |
|           |                 |                     |            |           |                                    | Future    |
|           |                 |                     |            |           |                                    | Growth    |
|           |                 |                     |            |           | 0.2008                             | WLA       |
|           |                 |                     |            |           |                                    |           |
|           |                 |                     |            |           |                                    | Total     |
|           |                 |                     |            |           | 0.2053                             | WLA       |
|           |                 |                     |            |           | 39.9617                            | LA        |

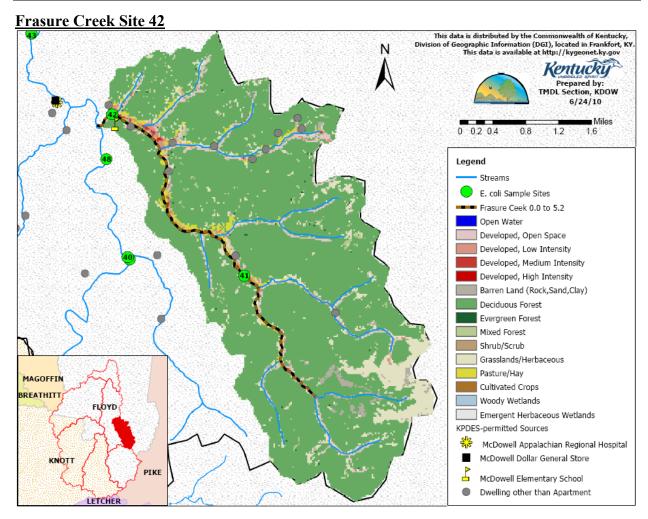


Figure E.9 Frasure Creek Site 42

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 47 is under site 40.

Frasure Creek at site 42 (RM 0.25) is a third order stream located in the Lower Left Fork Beaver Creek subwatershed in Floyd County (Figure E.9). Information about Frasure Creek at site 42, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.40. It has a catchment of 7,360 acres (11.5 square miles) with an 83% forested and 5.1% developed land cover (Table E.41). This watershed is un-sewered. There are no water withdrawals in this subwatershed. Sampling data from site 42 is presented in Table E.42, and the TMDL allocations in Table E.43.

Table E.40 Frasure Creek Site 42 Information

|         | Stream  |           |          |           | Square |               |         |       |          |
|---------|---------|-----------|----------|-----------|--------|---------------|---------|-------|----------|
| Stream  | Segment | WBID#     | County   | Acres     | Miles  | Stream Order  |         |       |          |
|         | Frasure |           |          |           |        |               |         |       |          |
|         | Creek   |           |          |           |        |               |         |       |          |
| Frasure | 0.0 to  |           |          |           |        |               |         |       |          |
| Creek   | 5.2     | 492466_01 | Floyd    | 7360.17   | 11.5   | 3rd order     |         |       |          |
|         |         |           |          |           |        |               |         | _     |          |
|         |         |           | Sample   | Sample    |        |               | + to    | from  | Adjusted |
| EKU     | MAP     | Sample    | Site     | Site      | MAF    | RM of MAF     | MAF     | MAF   | MAF      |
| Site #  | Site #  | Point RM  | Latitude | Longitude | (cfs)  | Determination | (cfs)   | (cfs) | (cfs)    |
| 42      | 42      | 0.25      | 37.45560 | -82.73680 | 15.6   | 0             | 0.03249 | 0     | 15.6325  |

Table E.41 Frasure Creek Site 42 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 0.00      | 0.00         | 0.00       |               |
| Developed            | 376.21    | 0.59         | 5.11       | 1.0           |
| Barren Land          | 115.46    | 0.18         | 1.57       |               |
| Forest/Shrubland     | 6099.62   | 9.53         | 82.87      |               |
| Grassland/Herbaceous | 611.81    | 0.96         | 8.31       |               |
| Pasture/ Hay         | 151.51    | 0.24         | 2.06       |               |
| Cultivated Crops     | 5.56      | 0.01         | 0.08       |               |
| Wetlands             | 0.00      | 0.00         | 0.00       | _             |
| Totals               | 7360.17   | 11.50        | 100.00     |               |

Table E.42 Frasure Creek Site 42 Data

|                        | E. coli<br>(colonies/100 |            | Instantaneous<br>Load (billion E. | Unit Area Load (million E. coli |
|------------------------|--------------------------|------------|-----------------------------------|---------------------------------|
| Collection Date        | mls)                     | Flow (cfs) | <u>coli</u> colonies/day)         | colonies/day/acre)              |
| 05/16/08               | 160                      | N/A        | N/A                               | N/A                             |
| 05/30/08               | 400                      | 1.3342     | 13.06                             | 1.77                            |
| 06/13/08               | 570                      | 6.321      | 88.15                             | 11.98                           |
| 06/27/08               | 560                      | 0.8631     | 11.83                             | 1.61                            |
| 07/31/08               | 43000                    | N/A        | N/A                               | N/A                             |
| 08/08/08               | 440                      | 0.588      | 6.33                              | 0.86                            |
| 08/22/08               | 900                      | 0.116      | 2.55                              | 0.35                            |
| 8/22/08 (QA Sample)    | 1100                     | N/A        | N/A                               | N/A                             |
| 09/12/08               | 3300                     | 0.709      | 57.24                             | 7.78                            |
| 9/12/08 (QA Sample)    | 3600                     | N/A        | N/A                               | N/A                             |
| 09/20/08               | 1900                     | 0.256      | 11.90                             | 1.62                            |
| 10/17/08               | 3200                     | 0.476      | 37.27                             | 5.06                            |
| 10/24/08               | 760                      | 0.211      | 3.92                              | 0.53                            |
| Greatest Concentration | 43000                    |            |                                   |                                 |

Table E.43 TMDLs for Frasure Creek Site 42

| 1 autc E.43                             | I MIDLS 101 F. | rasure Creek Sit | .e 42          |           |                  |               |
|---|----------------|------------------|----------------|-----------|------------------|---------------|
|   |                |                  |                |           | E. coli (billion |               |
| TMDL Table                              |                |                  |                |           | colonies/day)    |               |
|   |                |                  |                |           | 16445.8130       | Existing Load |
|   |                |                  |                |           | 91.7906          | Total TMDL    |
|   |                |                  |                |           | 9.1791           | MOS           |
|   |                |                  |                |           | 82.6115          | TMDL Target   |
|   |                |                  |                | Design    | 02.0110          | THE THISE     |
|   |                | Discharger       | _              | Capacity  |                  |               |
| AI number                               | KPDES#         | Facility Name    | Туре           | (cfs)     | 99.50            | % reduction   |
|   |                |                  |                |           |                  |               |
| 25252                                   | ******         | MCDOWELL         | a 1 1          |           | 0.0045           | KPDES         |
| 35252                                   | KY0079421      | ELEM SCHOOL      | School         | 0.0232084 | 0.0045           | WLA           |
|   |                | MITCHELL         | Dwelling Other |           |                  | KPDES         |
| 1269                                    | KYG400478      | RESIDENCE        | than Apartment | 0.0007736 | 0.0045           | WLA           |
|   |                | STUMBO           | Dwelling Other |           |                  | KPDES         |
| 1327                                    | KYG400601      | RESIDENCE        | than Apartment | 0.0007736 | 0.0045           | WLA           |
|   |                | DYE              | Dwelling Other |           | 0,0010           | KPDES         |
| 1182                                    | KYG400614      | RESIDENCE        | than Apartment | 0.0007736 | 0.0045           | WLA           |
| 1102                                    | 1110100011     | HALL             | Dwelling Other | 0.0007720 | 0,0010           | KPDES         |
| 1202                                    | KYG400969      | RESIDENCE        | than Apartment | 0.0007736 | 0.0045           | WLA           |
|   |                | HOWELL           | Dwelling Other |           | 0,0010           | KPDES         |
| 4356                                    | KYG401040      | RESIDENCE        | than Apartment | 0.0007736 | 0.0045           | WLA           |
| 4330                                    | K10401040      | MOORE            | Dwelling Other | 0.0007730 | 0.0043           | KPDES         |
| 35887                                   | KYG401533      | RESIDENCE        | than Apartment | 0.0007736 | 0.0045           | WLA           |
| 33007                                   | K10401333      | BLANKENSHIP      | Dwelling Other | 0.0007730 | 0.0043           | KPDES         |
| 50021                                   | KYG401692      | RESIDENCE        | than Apartment | 0.0007736 | 0.0045           | WLA           |
| 30021                                   | 1010101072     | NEWMAN           | Dwelling Other | 0.0007750 | 0.00-13          | KPDES         |
| 71436                                   | KYG401809      | RESIDENCE        | than Apartment | 0.0007736 | 0.0045           | WLA           |
| ,1.50                                   | 1110101000     | COMBS            | Dwelling Other | 0.0007720 | 0.0012           | KPDES         |
| 74243                                   | KYG401821      | RESIDENCE        | than Apartment | 0.0007736 | 0.0045           | WLA           |
| 7 12 13                                 | 1110101021     | HARVEL           | Dwelling Other | 0.0007720 | 0.0012           | KPDES         |
| 79525                                   | KYG401931      | RESIDENCE        | than Apartment | 0.0007736 | 0.0045           | WLA           |
| ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |                | MARTIN           | Dwelling Other |           |                  | KPDES         |
| 81193                                   | KYG401970      | RESIDENCE        | than Apartment | 0.0007736 | 0.0045           | WLA           |
|   |                | LITTLE           | Dwelling Other |           |                  | KPDES         |
| 103052                                  | KYG402117      | RESIDENCE        | than Apartment | 0.0007736 | 0.1363           | WLA           |
|   |                |                  | •              |           |                  | Total         |
|   |                |                  |                |           |                  | KPDES         |
|   |                |                  |                |           | 0.1908           | WLA           |
|   |                |                  | Addition to    |           |                  |               |
|   |                |                  | MAF (sum of    |           |                  |               |
|   |                |                  | cfs)           | 0.0324918 | 82.4207          | remainder     |
|   |                |                  |                |           |                  | Future        |
|   |                |                  |                |           |                  | Growth        |
|   |                |                  |                |           | 0.8242           | WLA           |
|   |                |                  |                |           | 1.0150           | Total WLA     |
|   |                |                  |                |           | 81.5965          | LA            |

## **Left Fork Beaver Creek Site 45**

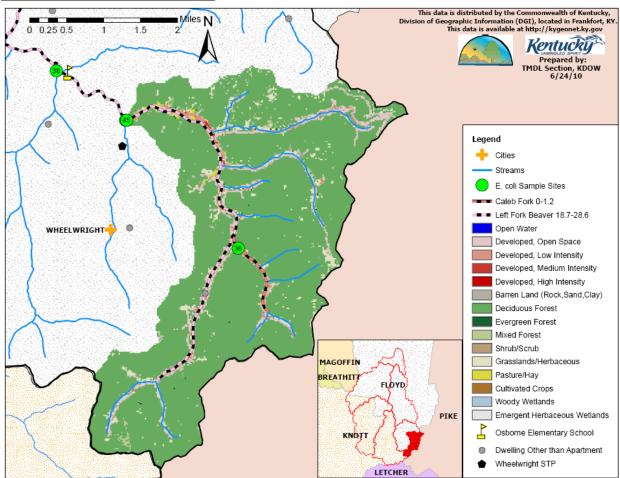


Figure E.10 Left Fork Beaver Creek Site 45

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 37 is under site 45.

Left Fork Beaver Creek at site 45 (RM 23.4) is a fourth order stream located in the Upper Left Fork subwatershed in Floyd County (Figure E.10). Information about Left Fork Beaver Creek at site 45, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.44. It has a catchment of 7,019 acres (11 square miles) with an 87% forested and 6.9% developed land cover (Table E.45). Portions of this watershed around the city of Wheelwright are sewered (see Figure 5.16). There are no water withdrawals in this subwatershed. Sampling data from site 45 is presented in Table E.46, and the TMDL allocations in Table E.47.

Table E.44 Left Fork Beaver Creek Site 45 Information

| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |       |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|-------|----------|
|        | Left              |           |          |           |                 |               |         |       |          |
|        | Fork              |           |          |           |                 |               |         |       |          |
| Left   | Beaver            |           |          |           |                 |               |         |       |          |
| Fork   | Creek             |           |          |           |                 |               |         |       |          |
| Beaver | 18.7 to           |           |          |           |                 |               |         |       |          |
| Creek  | 28.6              | 496194_04 | Floyd    | 7019.46   | 10.97           | 4th order     |         |       |          |
|        |                   |           |          |           |                 |               |         | -     |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | from  | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF   | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs) | (cfs)    |
| 45     | 45                | 23.4      | 37.35390 | -82.71630 | 15.4            | 23.4          | 0.00077 | 0     | 15.4008  |

Table E.45 Left Fork Beaver Creek Site 45 Subwatershed Land Cover

|                      |                 | Watershed    | % of Total | Future Growth |
|----------------------|-----------------|--------------|------------|---------------|
| Land Cover           | Watershed Acres | Square Miles | Area       | WLA %         |
| Open Water           | 0.00            | 0.00         | 0.00       |               |
| Developed            | 482.05          | 0.75         | 6.87       | 1             |
| Barren Land          | 59.62           | 0.09         | 0.85       |               |
| Forest/Shrubland     | 6114.97         | 9.55         | 87.11      |               |
| Grassland/Herbaceous | 332.34          | 0.52         | 4.73       |               |
| Pasture/Hay          | 29.36           | 0.05         | 0.42       |               |
| Cultivated Crops     | 0.89            | 0.00         | 0.01       |               |
| Wetlands             | 0.22            | 0.00         | 0.00       |               |
| Totals               | 7019.46         | 10.97        | 100.00     |               |

Table E.46 Left Fork Beaver Creek Site 45 Data

| Collection Date        | E. coli<br>(colonies/ 100<br>mls) | Flow (cfs) | Instantaneous Load<br>(billion <u>E</u> . <u>coli</u><br>colonies/day) | Unit Area Load<br>(million <u>E</u> . <u>coli</u><br>colonies/day/acre) |
|------------------------|-----------------------------------|------------|--|---|
| 05/16/08               | 3900                              | 4.395      | 419.36   | 59.74   |
| 05/30/08               | 1400                              | 21.576     | 739.02   | 105.28  |
| 06/13/08               | 2500                              | 0.138      | 8.44   | 1.20  |
| 06/27/08               | 580                               | 1.103      | 15.65  | 2.23  |
| 07/11/08               | 310                               | 0.555      | 4.21   | 0.60  |
| 07/31/08               | >80000                            | 5.316      | 10404.80   | 1482.28   |
| 08/08/08               | 740                               | 0.689      | 12.47  | 1.78  |
| 08/22/08               | 600                               | 0.508      | 7.46   | 1.06  |
| 09/12/08               | 30000                             | 0.520      | 381.67   | 54.37   |
| 09/20/08               | 2000                              | 0.158      | 7.73   | 1.10  |
| 10/17/08               | 6800                              | 0.958      | 159.38   | 22.71   |
| 10/24/08               | 860                               | 0.433      | 9.11   | 1.30  |
| 10/24/08 (QA Sample)   | 390                               | N/A        | N/A  | N/A   |
| Greatest Concentration | 80000                             |            |  |   |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

Table E.47 TMDLs for Left Fork Beaver Creek Site 45

| Table L.T/ | TWIDES TOT E | CIT TOIK Deaver | CICCK DIC 4. |             |                                    |           |
|------------|--------------|-----------------|--------------|-------------|------------------------------------|-----------|
| TMDL       |              |                 |              |             | <u>E</u> . <u>coli</u><br>(billion |           |
| Table      |              |                 |              |             | colonies/day)                      |           |
| 14010      |              |                 |              |             | coronies, day)                     | Existing  |
| Site 45    |              |                 |              |             | 30143.3285                         | Load      |
|            |              |                 |              |             |                                    | Total     |
|            |              |                 |              |             | 90.4300                            | TMDL      |
|            |              |                 |              |             | 9.0430                             | MOS       |
|            |              |                 |              |             |                                    | TMDL      |
|            |              |                 |              |             | 81.3870                            | Target    |
|            |              | Discharger      |              | Design      |                                    |           |
| AI         |              | Facility        |              | Capacity    |                                    | %         |
| number     | KPDES#       | Name            | Type         | (cfs)       | 99.73                              | reduction |
|            |              |                 | Dwelling     |             |                                    |           |
|            |              | TACKETT         | Other than   |             |                                    | KPDES     |
| 74181      | KYG401470    | RESIDENCE       | Apartment    | 0.000773615 | 0.0045                             | WLA       |
|            |              |                 | Addition     |             |                                    |           |
|            |              |                 | to MAF       |             |                                    |           |
|            |              |                 | (sum of      |             |                                    |           |
|            |              |                 | cfs)         | 0.000773615 | 81.3824                            | remainder |
|            |              |                 |              |             |                                    | Future    |
|            |              |                 |              |             |                                    | Growth    |
|            |              |                 |              |             | 0.8138                             | WLA       |
|            |              |                 |              |             |                                    |           |
|            |              |                 |              |             |                                    | Total     |
|            |              |                 |              |             | 0.8183                             | WLA       |
|            |              |                 |              |             | 80.5686                            | LA        |

## **Left Fork Beaver Creek Site 49**

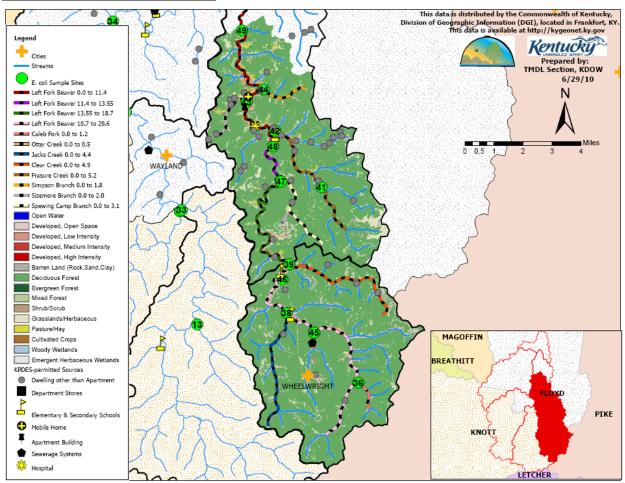


Figure E.11 Left Fork Beaver Creek Site 49

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Left Fork Beaver Creek at site 49 (RM 5.6) is a fourth order stream located in Floyd County (Figure E.11). Its watershed consists of the Upper and part of the Lower Left Fork Beaver Creek subwatersheds. Information about Left Fork Beaver Creek at site 49, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.48. It has a catchment of 40,027 acres (62.5 square miles) with an 83% forested and 6.6% developed land cover (Table E.49). Portions of this watershed around the city of Wheelwright are sewered (see Figure 5.16). There is one water withdrawal in this subwatershed (Table E.50). Sampling data from site 49 is presented in Table E.51, and the TMDL allocations in Table E.52.

Table E.48 Left Fork Beaver Creek Site 49 Information

| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |         |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|---------|----------|
| Stream | Left              | WBIB II   | County   | 110105    | TVIIICS         | Stream Graci  |         |         |          |
|        | Fork              |           |          |           |                 |               |         |         |          |
| Left   | Beaver            |           |          |           |                 |               |         |         |          |
| Fork   | Creek             |           |          |           |                 |               |         |         |          |
| Beaver | 0.0 to            |           |          |           |                 |               |         |         |          |
| Creek  | 11.4              | 496194_01 | Floyd    | 40026.78  | 62.54           | 4th order     |         |         |          |
|        |                   |           |          |           |                 |               |         |         |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from  | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 49     | 49                | 5.6       | 37.50640 | -82.75550 | 84.5            | 5.6           | 0.50857 | 0.09283 | 84.9157  |

Table E.49 Left Fork Beaver Creek Site 49 Subwatershed Land Cover

|                       | Watershed | Watershed    | % of Total | Future Growth |
|-----------------------|-----------|--------------|------------|---------------|
| Land Cover            | Acres     | Square Miles | Area       | WLA %         |
| Open Water            | 4.46      | 0.01         | 0.01       |               |
| Developed             | 2648.50   | 4.14         | 6.62       | 1             |
| Barren Land           | 408.58    | 0.64         | 1.02       |               |
| Forest/Shrubland      | 33389.72  | 52.17        | 83.42      |               |
| Grassland/ Herbaceous | 2646.27   | 4.13         | 6.61       |               |
| Pasture/Hay           | 872.21    | 1.36         | 2.18       |               |
| Cultivated Crops      | 53.72     | 0.08         | 0.13       |               |
| Wetlands              | 3.34      | 0.01         | 0.01       |               |
| Totals                | 40026.78  | 62.54        | 100.00     |               |

Table E.50 Left Fork Beaver Creek Site 49 Water Withdrawals

| AI<br>number | Source<br>Description                    | Withdrawal Facility<br>Name | Withdrawal (cfs) | Facility<br>Latitude | Facility<br>Longitude |
|--------------|--|-----------------------------|------------------|----------------------|-----------------------|
| 1299         | RM 15.36 of<br>Left Fork<br>Beaver Creek | Elk Horn Coal Co LLC        | 0.09283372       | 37.40129             | -82.74175             |
|              |  | subtraction from MAF        | 0.09283372       |                      |                       |

Table E.51 Left Fork Beaver Creek Site 49 Data

| - 44                   | E. coli<br>(colonies/100 | Flow   | Instantaneous Load (billion <u>E</u> . | Unit Area Load (million <u>E</u> . <u>coli</u> |
|------------------------|--------------------------|--------|--|--|
| Collection Date        | mls)                     | (cfs)  | <u>coli</u> colonies/day)              | colonies/day/acre)                             |
| 05/16/08               | 170                      | N/A    | N/A                                    | N/A  |
| 05/30/08               | 30                       | 11.975 | 8.79                                   | 0.22   |
| 5/30/08 (QA Sample)    | 20                       | N/A    | N/A                                    | N/A  |
| 06/13/08               | 60                       | 7.4685 | 10.96                                  | 0.27   |
| 06/27/08               | 110                      | 7.915  | 21.30                                  | 0.53   |
| 07/31/08               | 53000                    | 37.108 | 48117.39                               | 1202.13  |
| 08/08/08               | 70                       | 8.333  | 14.27                                  | 0.36   |
| 08/22/08               | <10                      | 1.803  | 0.44                                   | 0.01   |
| 09/12/08               | 380                      | N/A    | N/A                                    | N/A  |
| 9/12/08 (QA Sample)    | 240                      | N/A    | N/A                                    | N/A  |
| 09/20/08               | 130                      | 1.8648 | 5.93                                   | 0.15   |
| 10/17/08               | 100                      | 3.999  | 9.78                                   | 0.24   |
| 10/24/08               | 170                      | 3.356  | 13.96                                  | 0.35   |
| Greatest Concentration | 53000                    |        |  |  |

Table E.52 TMDLs for Left Fork Beaver Creek Site 49

|        |           |               | CICCK DILC 17 |           |                  |             |
|--------|-----------|---------------|---------------|-----------|------------------|-------------|
| TMDL   |           |               |               |           | E. coli (billion |             |
| Table  |           |               |               |           | colonies/day)    |             |
|        |           |               |               |           |                  | Existing    |
|        |           |               |               |           | 110108.9835      | Load        |
|        |           |               |               |           |                  | Total       |
|        |           |               |               |           | 498.6067         | TMDL        |
|        |           |               |               |           | 49.8607          | MOS         |
|        |           |               |               |           |                  | TMDL        |
|        |           |               |               |           | 448.7460         | Target      |
|        |           |               |               | Design    |                  | J           |
| AI     |           | Discharger    |               | Capacity  |                  |             |
| number | KPDES#    | Facility Name | Type          | (cfs)     | 99.59            | % reduction |
|        |           | WHEELWRIGHT   | Sewerage      | Ì         |                  | KPDES       |
| 40534  | KY0028789 | STP           | System        | 0.3481265 | 2.0441           | WLA         |
|        |           | MCDOWELL      | •             |           |                  | KPDES       |
| 35252  | KY0079421 | ELEM SCHOOL   | School        | 0.0232084 | 0.1363           | WLA         |
|        |           | MCDOWELL      |               |           |                  |             |
|        |           | APPALACHIAN   |               |           |                  | KPDES       |
| 1134   | KY0085791 | REG HOSP      | Hospital      | 0.0309446 | 0.1817           | WLA         |
|        |           | OSBORNE       |               |           |                  | KPDES       |
| 35251  | KY0089435 | ELEM SCHOOL   | School        | 0.0105212 | 0.0618           | WLA         |
|        |           | SOUTH FLOYD   |               |           |                  | KPDES       |
| 35260  | KY0093912 | HIGH SCHOOL   | School        | 0.0232084 | 0.1363           | WLA         |
|        |           | LEFT BEAVER   |               |           |                  |             |
|        |           | CREEK         | Apartment     |           |                  | KPDES       |
| 1255   | KY0096342 | TOWNHOUSES    | Building      | 0.0278501 | 0.1635           | WLA         |

|        |                 |                    |                        | Design     |                  |   |
|--------|-----------------|--------------------|------------------------|------------|------------------|---|
| AI     |                 | Discharger         |                        | Capacity   | E. coli (billion |   |
| number | KPDES#          | Facility Name      | Туре                   | (cfs)      | colonies/day)    |   |
|        |                 | MCDOWELL           | 71                     |            | •                |   |
|        |                 | DOLLAR             |                        |            |                  |   |
|        |                 | GENERAL            | Department             |            |                  | KPDES                                   |
| 1263   | KY0103136       | STORE              | Store                  | 0.0007736  | 0.0045           | WLA                                     |
|        |                 |                    | Mobile                 |            |                  | KPDES                                   |
| 1305   | KY0103233       | S & V MHP          | Home Site              | 0.0153176  | 0.0899           | WLA                                     |
|        |                 |                    | Dwelling               |            |                  |   |
|        |                 | MITCHELL           | Other than             |            |                  | KPDES                                   |
| 1269   | KYG400478       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
|        |                 |                    | Dwelling               |            |                  |   |
|        |                 | BLACKBURN          | Other than             |            |                  | KPDES                                   |
| 1143   | KYG400479       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
|        |                 | HICKG              | Dwelling               |            |                  | LADDEC                                  |
| 1010   | WWG 400565      | HICKS              | Other than             | 0.0007736  | 0.0045           | KPDES                                   |
| 1218   | KYG400567       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
|        |                 | CTLIMPO            | Dwelling               |            |                  | LADDEC                                  |
| 1227   | IZVC400601      | STUMBO             | Other than             | 0.0007726  | 0.0045           | KPDES                                   |
| 1327   | KYG400601       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
|        |                 | DVE                | Dwelling<br>Other than |            |                  | LIDDEC                                  |
| 1182   | KYG400614       | DYE<br>RESIDENCE   | Apartment              | 0.0007736  | 0.0045           | KPDES                                   |
| 1102   | K1 0400014      | RESIDENCE          | Dwelling               | 0.0007730  | 0.0045           | WLA                                     |
|        |                 | MULLINS            | Other than             |            |                  | KPDES                                   |
| 1274   | KYG400714       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
| 12/4   | K10400/14       | RESIDENCE          | Dwelling               | 0.0007730  | 0.0043           | WLA                                     |
|        |                 | YOUMANS            | Other than             |            |                  | KPDES                                   |
| 1369   | KYG400724       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
| 1507   | 111 0 100 / 2 1 | REGIBERGE          | Dwelling               | 0.0007720  | 0.0013           | *************************************** |
|        |                 | BINGHAM            | Other than             |            |                  | KPDES                                   |
| 1237   | KYG400753       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
|        |                 |                    | Dwelling               |            |                  |   |
|        |                 | COOK               | Other than             |            |                  | KPDES                                   |
| 1173   | KYG400790       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
|        |                 |                    | Dwelling               |            |                  |   |
|        |                 | COLLINS            | Other than             |            |                  | KPDES                                   |
| 1168   | KYG400854       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
|        |                 |                    | Dwelling               |            |                  |   |
|        |                 | HALL               | Other than             |            |                  | KPDES                                   |
| 1202   | KYG400969       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
|        |                 |                    | Dwelling               |            |                  |   |
| 10.55  | H1101000        | MEADE              | Other than             | 0.000==2.5 | 0.00.17          | KPDES                                   |
| 1266   | KYG400970       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
|        |                 | HOWELL             | Dwelling               |            |                  | LADDEC                                  |
| 1256   | VVC401040       | HOWELL             | Other than             | 0.0007726  | 0.0045           | KPDES                                   |
| 4356   | KYG401040       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
|        |                 | IONEC              | Dwelling<br>Other then |            |                  | LIDDEC                                  |
| 4349   | KYG401133       | JONES<br>RESIDENCE | Other than             | 0.0007736  | 0.0045           | KPDES                                   |
| 4349   | K10401133       | RESIDENCE          | Apartment Dwelling     | 0.0007730  | 0.0045           | WLA                                     |
|        |                 | DYE                | Other than             |            |                  | KPDES                                   |
| 4333   | KYG401140       | RESIDENCE          | Apartment              | 0.0007736  | 0.0045           | WLA                                     |
| 4333   | K1U401140       | RESIDENCE          | Apartment              | 0.0007730  | 0.0045           | WLA                                     |

|        |               |                   |                        | Design    |                  |           |
|--------|---------------|-------------------|------------------------|-----------|------------------|-----------|
| AI     |               | Discharger        |                        | Capacity  | E. coli (billion |           |
| number | KPDES#        | Facility Name     | Туре                   | (cfs)     | colonies/day)    |           |
|        |               |                   | Dwelling               |           |                  |           |
|        |               | TACKETT           | Other than             |           |                  | KPDES     |
| 4332   | KYG401142     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
|        |               |                   | Dwelling               |           |                  |           |
|        |               | BARTLEY           | Other than             |           |                  | KPDES     |
| 4405   | KYG401197     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
|        |               | T A WIGON         | Dwelling               |           |                  |           |
| 15625  | 1/1/0/401071  | LAWSON            | Other than             | 0.0007736 | 0.004=           | KPDES     |
| 15635  | KYG401271     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
|        |               | WILLIAMCON        | Dwelling               |           |                  | LIDDEC    |
| 74022  | LVC401406     | WILLIAMSON        | Other than             | 0.0007726 | 0.0045           | KPDES     |
| 74022  | KYG401406     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
|        |               | STUMBO            | Dwelling<br>Other than |           |                  | KPDES     |
| 74025  | KYG401409     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
| 74023  | K 1 0401409   | RESIDENCE         | Dwelling               | 0.0007730 | 0.0043           | WLA       |
|        |               | MULLINS II        | Other than             |           |                  | KPDES     |
| 74062  | KYG401442     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
| 74002  | K10401442     | RESIDENCE         | Dwelling               | 0.0007730 | 0.0043           | VVE       |
|        |               | TACKETT           | Other than             |           |                  | KPDES     |
| 74181  | KYG401470     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
| , .101 | 121 0 101 170 | TELETELITE        | Dwelling               | 0.0007720 | 0.0016           | VV 2211   |
|        |               | COLLINS           | Other than             |           |                  | KPDES     |
| 1168   | KYG401516     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
|        |               |                   | Dwelling               |           |                  |           |
|        |               | MOORE             | Other than             |           |                  | KPDES     |
| 35887  | KYG401533     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
|        |               |                   | Dwelling               |           |                  |           |
|        |               | CAUDILL           | Other than             |           |                  | KPDES     |
| 44695  | KYG401580     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
|        |               |                   | Dwelling               |           |                  |           |
|        |               | GEARHEART         | Other than             |           |                  | KPDES     |
| 45396  | KYG401587     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
|        |               | ****              | Dwelling               |           |                  |           |
| 45050  | WW.C.401.500  | HALL              | Other than             | 0.0005536 | 0.0045           | KPDES     |
| 45070  | KYG401590     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
|        |               | DUEE              | Dwelling               |           |                  | LADEC     |
| 10061  | KYG401645     | DUFF<br>RESIDENCE | Other than             | 0.0007736 | 0.0045           | KPDES     |
| 48864  | K10401043     | KESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
|        |               | COCHRAN           | Dwelling<br>Other than |           |                  | KPDES     |
| 48897  | KYG401646     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
| 70071  | K10401040     | RESIDENCE         | Dwelling               | 0.0007730 | 0.0043           | VILA      |
|        |               | YORK              | Other than             |           |                  | KPDES     |
| 49354  | KYG401654     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
| .,,,,, | 111 5 10105 1 | TESTEE            | Dwelling               | 0.0007750 | 3.00.0           | , , , , , |
|        |               | BLANKENSHIP       | Other than             |           |                  | KPDES     |
| 50021  | KYG401692     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |
|        |               |                   | Dwelling               |           |                  |           |
|        |               | NEWMAN            | Other than             |           |                  | KPDES     |
| 71436  | KYG401809     | RESIDENCE         | Apartment              | 0.0007736 | 0.0045           | WLA       |

|          |        |              |               |             | Design     |                  |           |
|----------|--------|--------------|---------------|-------------|------------|------------------|-----------|
|          | AI     |              | Discharger    |             | Capacity   | E. coli (billion |           |
|          | number | KPDES#       | Facility Name | Type        | (cfs)      | colonies/day)    |           |
|          |        |              |               | Dwelling    |            |                  |           |
|          |        |              | COMBS         | Other than  |            |                  | KPDES     |
|          | 74243  | KYG401821    | RESIDENCE     | Apartment   | 0.0007736  | 0.0045           | WLA       |
|          |        |              |               | Dwelling    |            |                  |           |
|          |        |              | HARVEL        | Other than  |            |                  | KPDES     |
|          | 79525  | KYG401931    | RESIDENCE     | Apartment   | 0.0007736  | 0.0045           | WLA       |
|          |        |              |               | Dwelling    |            |                  |           |
|          |        |              | MARTIN        | Other than  |            |                  | KPDES     |
| Ц        | 81193  | KYG401970    | RESIDENCE     | Apartment   | 0.0007736  | 0.0045           | WLA       |
|          |        |              |               | Dwelling    |            |                  |           |
|          |        |              | HOPKINS       | Other than  |            |                  | KPDES     |
|          | 82471  | KYG402002    | RESIDENCE     | Apartment   | 0.0007736  | 0.0045           | WLA       |
|          |        |              |               | Dwelling    |            |                  |           |
|          | 102052 | TTTTC 400115 | LITTLE        | Other than  | 0.000==2.6 | 0.004=           | KPDES     |
| L        | 103052 | KYG402117    | RESIDENCE     | Apartment   | 0.0007736  | 0.0045           | WLA       |
|          |        |              |               |             |            |                  |           |
|          |        |              |               |             |            |                  | Total     |
|          |        |              |               |             |            | 2.0072           | KPDES     |
|          |        |              |               | A 1111      |            | 2.9862           | WLA       |
|          |        |              |               | Addition to |            |                  |           |
|          |        |              |               | MAF (sum    | 0.5005740  | 445.7500         |           |
| _        |        |              |               | of cfs)     | 0.5085742  | 445.7598         | remainder |
|          |        |              |               |             |            |                  | T         |
|          |        |              |               |             |            |                  | Future    |
|          |        |              |               |             |            | A 4576           | Growth    |
| $\vdash$ |        |              |               |             |            | 4.4576           | WLA       |
|          |        |              |               |             |            | 7.4438           | Total WLA |
|          |        |              |               |             |            | 441.3022         | LA        |
| L        |        |              |               |             |            | 441.3022         | LA        |

KNOTT

#### This data is distributed by the Commonwealth of Kentucky, Legend ographic Information (DGI), located in Frankfort, KY This data is available at http://kygeonet.ky.gov Cities Kentucků E. coli Sample Sites TMDL Section, KDOW ■ Left Fork Beaver 0.0 to 11.4 6/24/10 Left Fork Beaver 11.4 to 13.55 Left Fork Beaver 13,55 to 18,7 Left Fork Beaver 18.7 to 28.6 COAL RUN VILLAGE Caleb Fork 0.0 to 1.2 Otter Creek 0.0 to 0.5 Jacks Creek 0.0 to 4.4 Clear Creek 0.0 to 4.9 Frasure Creek 0.0 to 5.2 PIKEVILLE Simpson Branch 0.0 to 1.8 Spurlock Creek 0.0 to 0.6 Spurlock Creek 0.6 to 4.0 Sizemore Branch 0.0 to 2.0 ■ I Spewing Camp Branch 0.0 to 3.1 Open Water Developed, Open Space Developed, Low Intensity Developed, Medium Intensity Developed, High Intensity Barren Land (Rock,Sand,Clay) Deciduous Forest Evergreen Forest Mixed Forest Shrub/Scrub Grasslands/Herbaceous Pasture/Hav MAGOFFIN Cultivated Crops Woody Wetlands Emergent Herbaceous Wetlands KPDES-permitted Sources Dwelling other than Apartment Department Stores PIKE Elementary & Secondary School

#### **Left Fork Beaver Creek Site 50**

Figure E.12 Left Fork Beaver Creek Site 50

Mobile Home

Apartment Building Sewerage Systems

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 27 is under site 35, site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Left Fork Beaver Creek at site 50 (RM 0.3) is a fourth order stream located in Floyd County (Figure E.12). Its watershed consists of the Upper and Lower Left Fork Beaver Creek subwatersheds. Information about Left Fork Beaver Creek at site 50, including sample site location, waterbody identification number (WBID), and MAF is shown in Table E.53. It has a catchment of 46, 862 acres (73.2 square miles) with an 82% forested and 6.8 % developed land cover (Table E.54). Portions of this watershed around the city of Wheelwright are sewered (see Figure 5.16). There are two water withdrawals in this subwatershed (Table E.55). Sampling data from site 50 is presented in Table E.56, and the TMDL allocations in Table E.57.

Table E.53 Left Fork Beaver Creek Site 50 Information

| Tuoie E | dole E.33 Bett Fork Bedver Creek Site 30 information |           |          |           |                 |               |         |         |          |  |
|---------|--|-----------|----------|-----------|-----------------|---------------|---------|---------|----------|--|
| Stream  | Stream<br>Segment                                    | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |         |          |  |
|         | Left   |           | ,        |           |                 |               |         |         |          |  |
|         | Fork   |           |          |           |                 |               |         |         |          |  |
| Left    | Beaver   |           |          |           |                 |               |         |         |          |  |
| Fork    | Creek  |           |          |           |                 |               |         |         |          |  |
| Beaver  | 0.0 to   |           |          |           |                 |               |         |         |          |  |
| Creek   | 11.4   | 496194_01 | Floyd    | 46861.59  | 73.221          | 4th order     |         |         |          |  |
|         |  |           |          |           |                 |               |         |         |          |  |
|         |  |           | Sample   | Sample    |                 |               | + to    | - from  | Adjusted |  |
| EKU     | MAP  | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF     | MAF      |  |
| Site #  | Site #   | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |  |
| 50      | 50   | 0.3       | 37.55640 | -82.74970 | 98              | 0             | 0.51476 | 0.76124 | 97.7535  |  |

Table E.54 Left Fork Beaver Creek Site 50 Subwatershed Land Cover

|                      | Watershed | Watershed    | % of Total | Future Growth |
|----------------------|-----------|--------------|------------|---------------|
| Land Cover           | Acres     | Square Miles | Area       | WLA %         |
| Open Water           | 12.46     | 0.02         | 0.03       |               |
| Developed            | 3207.43   | 5.01         | 6.84       | 1.0           |
| Barren Land          | 483.82    | 0.76         | 1.03       |               |
| Forest/Shrubland     | 38659.82  | 60.41        | 82.50      |               |
| Grassland/Herbaceous | 3224.34   | 5.04         | 6.88       |               |
| Pasture/Hay          | 1178.07   | 1.84         | 2.51       |               |
| Cultivated Crops     | 90.31     | 0.14         | 0.19       |               |
| Wetlands             | 5.34      | 0.01         | 0.01       |               |
| Totals               | 46861.59  | 73.22        | 100.00     | _             |

Table E.55 Left Fork Beaver Creek Site 50 Water Withdrawals

| AI     |                       | Withdrawal Facility | Withdrawal | Facility | Facility  |
|--------|-----------------------|---------------------|------------|----------|-----------|
| number | Source Description    | Name                | (cfs)      | Latitude | Longitude |
|        |                       |                     |            |          |           |
|        | RM 15.36 of Left Fork | Elk Horn Coal Co    |            |          |           |
| 1299   | Beaver Creek          | LLC                 | 0.09283372 | 37.40129 | -82.74175 |
|        |                       |                     |            |          |           |
|        | RM 2.4 of Left Fork   | Black Diamond       |            |          |           |
| 78571  | Beaver Creek          | Mining              | 0.6684028  | 37.53192 | -82.74364 |
|        |                       | subtraction from    |            |          |           |
|        |                       | MAF                 | 0.76123652 |          |           |

Table E.56 Left Fork Beaver Creek Site 50 Data

|                               | F1:                    | E1     | Instantaneous             | Unit Area Load                  |
|-------------------------------|------------------------|--------|---------------------------|---------------------------------|
|                               | <u>E</u> . <u>coli</u> | Flow   | Load (billion <u>E</u> .  | (million <u>E</u> . <u>coli</u> |
| Collection Date               | (colonies/100 mls)     | (cfs)  | <u>coli</u> colonies/day) | colonies/day/acre)              |
| 05/16/08                      | 390                    | N/A    | N/A                       | N/A                             |
| 05/30/08                      | 600                    | N/A    | N/A                       | N/A                             |
| 06/13/08                      | 220                    | N/A    | N/A                       | N/A                             |
| 6/13/08 (QA Sample)           | 190                    | N/A    | N/A                       | N/A                             |
| 06/27/08                      | 70                     | N/A    | N/A                       | N/A                             |
| 07/11/08                      | 390                    | 12.956 | 123.62                    | 2.64                            |
| 07/31/08                      | 27000                  | N/A    | N/A                       | N/A                             |
| 08/08/08                      | 220                    | 5.708  | 30.72                     | 0.66                            |
| 08/22/08                      | 240                    | 0.0144 | 0.08                      | 0.00                            |
| 09/12/08                      | 16000                  | 22.148 | 8669.88                   | 185.01                          |
| 09/20/08                      | 170                    | 3.596  | 14.96                     | 0.32                            |
| 10/17/08                      | 180                    | 3.155  | 13.89                     | 0.30                            |
| 10/24/08                      | 10                     | 3.413  | 0.84                      | 0.02                            |
| <b>Greatest Concentration</b> | 27000                  |        | _                         | -                               |

Table E.57 TMDLs for Left Fork Beaver Creek Site 50

| 40534 | KY0028789              | STP           | Sewerage<br>System  | 0.348127 | 2.0441 | WLA          |
|-------|------------------------|---------------|---------------------|----------|--------|--------------|
|       |                        | MCDOWELL      |                     |          |        | KPDES        |
| 35252 | KY0079421              | ELEM SCHOOL   | School              | 0.023208 | 0.1363 | WLA          |
|       |                        | MCDOWELL      |                     |          |        |              |
|       |                        | APPALACHIAN   |                     |          |        | KPDES        |
| 1124  | IZX/0005701            |               | II                  | 0.020045 | 0.1017 |              |
| 1134  | KY0085791              | REG HOSP      | Hospital            | 0.030945 | 0.1817 | WLA          |
|       |                        | OSBORNE ELEM  |                     |          |        | KPDES        |
| 35251 | KY0089435              | SCHOOL        | School              | 0.010521 | 0.0618 | WLA          |
|       |                        | SOUTH FLOYD   |                     |          |        | KPDES        |
| 35260 | KY0093912              | HIGH SCHOOL   | School              | 0.023208 | 0.1363 | WLA          |
| 33200 | 1210073712             | LEFT BEAVER   | School              | 0.023200 | 0.1303 | WLA          |
|       |                        |               |                     |          |        | LADDEC       |
|       |                        | CREEK         | Apartment           |          |        | KPDES        |
|       |                        | TOWNHOUSES    | Building            | 0.02785  | 0.1635 | WLA          |
| 1255  | KY0096342              | 10 WINITOUSES |                     |          |        |              |
| 1255  | KY0096342              |               |                     |          |        |              |
| 1255  | KY0096342              | MCDOWELL      |                     |          |        | KPDES        |
| 1255  | KY0096342<br>KY0103136 |               | Department<br>Store | 0.000774 | 0.0045 | KPDES<br>WLA |

|           |            | Discharger Facility     |                         | Design<br>Capacity | E. coli (billion |              |
|-----------|------------|-------------------------|-------------------------|--------------------|------------------|--------------|
| AI number | KPDES#     | Name                    | Туре                    | (cfs)              | colonies/day)    |              |
|           |            |                         | Mobile                  |                    |                  | KPDES        |
| 1305      | KY0103233  | S & V MHP               | Home Site               | 0.015318           | 0.0899           | WLA          |
|           |            |                         | Dwelling                |                    |                  |              |
|           |            | MITCHELL                | Other than              |                    |                  | KPDES        |
| 1269      | KYG400478  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | WLA          |
|           |            | BLACKBURN               | Dwelling<br>Other than  |                    |                  | LIDDEC       |
| 1143      | KYG400479  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | KPDES<br>WLA |
| 1143      | KT G400477 | RESIDENCE               | Dwelling                | 0.000774           | 0.0043           | WLA          |
|           |            | HICKS                   | Other than              |                    |                  | KPDES        |
| 1218      | KYG400567  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | WLA          |
|           |            |                         | Dwelling                |                    |                  |              |
|           |            | WRIGHT                  | Other than              |                    |                  | KPDES        |
| 1367      | KYG400579  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | WLA          |
|           |            | STUMBO                  | Dwelling<br>Other than  |                    |                  | KPDES        |
| 1327      | KYG400601  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | WLA          |
| 1327      | K10400001  | RESIDENCE               | Dwelling                | 0.000774           | 0.0043           | WLA          |
|           |            |                         | Other than              |                    |                  | KPDES        |
| 1182      | KYG400614  | DYE RESIDENCE           | Apartment               | 0.000774           | 0.0045           | WLA          |
|           |            |                         | Dwelling                |                    |                  |              |
|           |            | CURRENT                 | Other than              |                    |                  | KPDES        |
| 4250      | KYG400659  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | WLA          |
|           |            | CHDEWDEDDY              | Dwelling                |                    |                  | LADDEC       |
| 1315      | KYG400677  | SHREWBERRY<br>RESIDENCE | Other than<br>Apartment | 0.000774           | 0.0045           | KPDES<br>WLA |
| 1313      | K104000//  | RESIDENCE               | Dwelling                | 0.000774           | 0.0043           | WLA          |
|           |            | CASTLE                  | Other than              |                    |                  | KPDES        |
| 1162      | KYG400678  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | WLA          |
|           |            |                         | Dwelling                |                    |                  |              |
|           |            | CASE                    | Other than              |                    |                  | KPDES        |
| 1161      | KYG400692  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | WLA          |
|           |            | MILITING                | Dwelling<br>Other than  |                    |                  | LIDDEC       |
| 1274      | KYG400714  | MULLINS<br>RESIDENCE    | Apartment               | 0.000774           | 0.0045           | KPDES<br>WLA |
| 12/4      | K1 0700/14 | RESIDENCE               | Dwelling                | 0.000774           | 0.0043           | WLA          |
|           |            | YOUMANS                 | Other than              |                    |                  | KPDES        |
| 1369      | KYG400724  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | WLA          |
|           |            |                         | Dwelling                |                    |                  |              |
|           |            | BINGHAM                 | Other than              | 0.000              |                  | KPDES        |
| 1237      | KYG400753  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | WLA          |
|           |            | COOK                    | Dwelling<br>Other than  |                    |                  | KDDEC        |
| 1173      | KYG400790  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | KPDES<br>WLA |
| 11/3      | K1 0400770 | RESIDENCE               | Dwelling                | 0.000777           | 0.0013           | WEA          |
|           |            | COLLINS                 | Other than              |                    |                  | KPDES        |
| 1168      | KYG400854  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | WLA          |
|           |            |                         | Dwelling                |                    |                  |              |
|           |            | HALL                    | Other than              |                    |                  | KPDES        |
| 1202      | KYG400969  | RESIDENCE               | Apartment               | 0.000774           | 0.0045           | WLA          |

|           |               |                     |            | Design   |                  |        |
|-----------|---------------|---------------------|------------|----------|------------------|--------|
|           |               | Discharger Facility |            | Capacity | E. coli (billion |        |
| AI number | KPDES#        | Name                | Туре       | (cfs)    | colonies/day)    |        |
|           |               |                     | Dwelling   |          |                  |        |
| 1000      | *****         | MEADE               | Other than |          |                  | KPDES  |
| 1266      | KYG400970     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
| 10.5      | ******        | HOWELL              | Other than |          | 0.004=           | KPDES  |
| 4356      | KYG401040     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               | IONIEG              | Dwelling   |          |                  |        |
| 12.10     | 17170101100   | JONES               | Other than | 0.000774 | 2 22 45          | KPDES  |
| 4349      | KYG401133     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  | LABBEC |
| 4222      | TTTT C 401140 | DIVE DEGIDENIGE     | Other than | 0.000554 | 0.004=           | KPDES  |
| 4333      | KYG401140     | DYE RESIDENCE       | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
| 1222      | WWG 101112    | TACKETT             | Other than | 0.000==: | 0.004=           | KPDES  |
| 4332      | KYG401142     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | BARTLEY             | Other than |          |                  | KPDES  |
| 4405      | KYG401197     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | LAWSON              | Other than |          |                  | KPDES  |
| 15635     | KYG401271     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | WILLIAMSON          | Other than |          |                  | KPDES  |
| 74022     | KYG401406     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | STUMBO              | Other than |          |                  | KPDES  |
| 74025     | KYG401409     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | MULLINS II          | Other than |          |                  | KPDES  |
| 74062     | KYG401442     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | TACKETT             | Other than |          |                  | KPDES  |
| 74181     | KYG401470     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | COLLINS             | Other than |          |                  | KPDES  |
| 1168      | KYG401516     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | MOORE               | Other than |          |                  | KPDES  |
| 35887     | KYG401533     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | CAUDILL             | Other than |          |                  | KPDES  |
| 44695     | KYG401580     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | DINGUS              | Other than |          |                  | KPDES  |
| 45073     | KYG401582     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | GEARHEART           | Other than |          |                  | KPDES  |
| 45396     | KYG401587     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |
|           |               |                     | Dwelling   |          |                  |        |
|           |               | HALL                | Other than |          |                  | KPDES  |
| 45070     | KYG401590     | RESIDENCE           | Apartment  | 0.000774 | 0.0045           | WLA    |

|           |               |                     |                        | Design   |   |   |
|-----------|---------------|---------------------|------------------------|----------|---|---|
|           |               | Discharger Facility |                        | Capacity | E. coli (billion                        |   |
| AI number | KPDES#        | Name                | Туре                   | (cfs)    | colonies/day)                           |   |
|           |               |                     | Dwelling               |          |   |   |
|           |               | WILLIAMSON          | Other than             |          |   | KPDES                                   |
| 46144     | KYG401601     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
|           |               | DITTE               | Dwelling               |          |   |   |
| 40064     | 17370 401 645 | DUFF                | Other than             | 0.000774 | 0.0045                                  | KPDES                                   |
| 48864     | KYG401645     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
|           |               | COCLIDAN            | Dwelling               |          |   | LIDDEC                                  |
| 40007     | 1/3/0/101/4/  | COCHRAN             | Other than             | 0.000774 | 0.0045                                  | KPDES                                   |
| 48897     | KYG401646     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
|           |               | YORK                | Dwelling<br>Other than |          |   | KPDES                                   |
| 49354     | KYG401654     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
| 49334     | K1 0401034    | RESIDENCE           | Dwelling               | 0.000774 | 0.0045                                  | WLA                                     |
|           |               | BLANKENSHIP         | Other than             |          |   | KPDES                                   |
| 50021     | KYG401692     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
| 30021     | K 1 0701072   | KEDIDENCE           | Dwelling               | 0.000774 | 0.0043                                  | WLA                                     |
|           |               | NEWMAN              | Other than             |          |   | KPDES                                   |
| 71436     | KYG401809     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
| 71130     | 111 ( 10100)  | REGIDENCE           | Dwelling               | 0.000771 | 0.0012                                  | *************************************** |
|           |               | COMBS               | Other than             |          |   | KPDES                                   |
| 74243     | KYG401821     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
|           |               |                     | Dwelling               |          | *************************************** |   |
|           |               | LITTLE              | Other than             |          |   | KPDES                                   |
| 75141     | KYG401851     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
|           |               |                     | Dwelling               |          |   |   |
|           |               | HARVEL              | Other than             |          |   | KPDES                                   |
| 79525     | KYG401931     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
|           |               |                     | Dwelling               |          |   |   |
|           |               | MARTIN              | Other than             |          |   | KPDES                                   |
| 81193     | KYG401970     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
|           |               |                     | Dwelling               |          |   |   |
|           |               | HOPKINS             | Other than             |          |   | KPDES                                   |
| 82471     | KYG402002     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
|           |               | LIMME               | Dwelling               |          |   | IIDE E C                                |
| 102052    | WWG 400115    | LITTLE              | Other than             | 0.000774 | 0.0045                                  | KPDES                                   |
| 103052    | KYG402117     | RESIDENCE           | Apartment              | 0.000774 | 0.0045                                  | WLA                                     |
|           |               |                     |                        |          |   | Total                                   |
|           |               |                     |                        |          | 2.0226                                  | KPDES                                   |
|           |               |                     | Addition to            |          | 3.0226                                  | WLA                                     |
|           |               |                     | MAF (sum               |          |   |   |
|           |               |                     | of cfs)                | 0.514763 | 513.5661                                | remainder                               |
|           |               |                     | 01 010)                | 0.011703 | 313.3001                                | Future                                  |
|           |               |                     |                        |          |   | Growth                                  |
|           |               |                     |                        |          | 5.1357                                  | WLA                                     |
|           |               |                     |                        |          |   |   |
|           |               |                     |                        |          |   | Total                                   |
|           |               |                     |                        |          | 8.1582                                  | WLA                                     |
|           |               |                     |                        |          | 508.4304                                | LA                                      |

# Appendix F. Information for Fully Supporting Segments

# Rock Fork RM 0.0 to 7.0

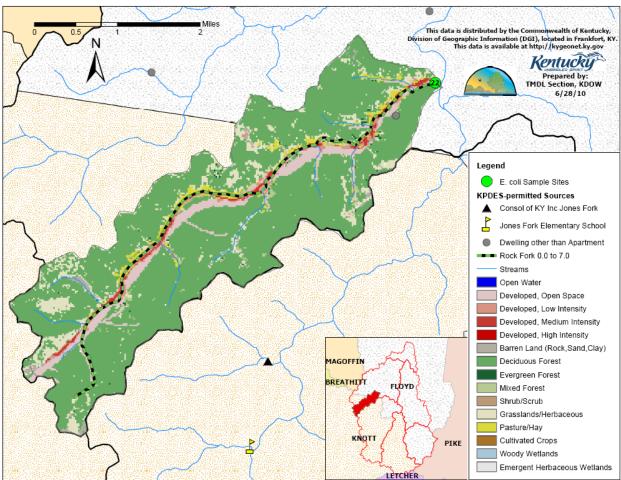


Figure F.1 Rock Fork RM 0.0 to 7.0

Rock Fork is a second order stream located in the Lower Right Fork Beaver Creek subwatershed in Floyd County (Figure F.1). Information about Rock Fork, including sample site location, waterbody identification number (WBID), and MAF is shown in Table F.1. It has a catchment of 5,333 acres (8.3 square miles) with a 77% forested and 10.2% developed land cover (Table F.2). This subwatershed is un-sewered. There are no stream water withdrawals in this subwatershed. Sampling data from site 22 is presented in Table F.3 and KPDES-permitted sources of pathogen indicators are shown in Table F.4. Because this is a fully supporting segment, TMDLs are not calculated.

Table F.1 Rock Fork RM 0.0 to 7.0 Information

| Tuoie I | . r recent r      | OIR ICIVI 0.0 | to 7.0 IIII | ormation  |                 |               | _,      |       |          |
|---------|-------------------|---------------|-------------|-----------|-----------------|---------------|---------|-------|----------|
| Stream  | Stream<br>Segment | WBID#         | County      | Acres     | Square<br>Miles | Stream Order  |         |       |          |
| Rock    | Rock<br>Fork 0.0  |               |             |           |                 |               |         |       |          |
| Fork    | to 7.0            | 502115_01     | Floyd       | 5333.35   | 8.333           | 2nd order     |         |       |          |
|         |                   |               |             |           |                 |               |         | -     |          |
|         |                   |               | Sample      | Sample    |                 |               | + to    | from  | Adjusted |
| EKU     | MAP               | Sample        | Site        | Site      | MAF             | RM of MAF     | MAF     | MAF   | MAF      |
| Site #  | Site #            | Point RM      | Latitude    | Longitude | (cfs)           | Determination | (cfs)   | (cfs) | (cfs)    |
| 22      | 22                | 0.1           | 37.48001    | -82.83621 | 11.1            | 0             | 0.00077 | 0.000 | 11.1077  |

Table F.2 Rock Fork RM 0.0 to 7.0 Subwatershed Land Cover

| Land Cover           | Watershed Acres | Watershed Square Miles | % of Total Area |
|----------------------|-----------------|------------------------|-----------------|
| Open Water           | 0.22            | 0.00                   | 0.00            |
| Developed            | 542.96          | 0.85                   | 10.18           |
| Barren Land          | 67.81           | 0.11                   | 1.27            |
| Forest/Shrubland     | 4082.22         | 6.38                   | 76.54           |
| Grassland/Herbaceous | 466.92          | 0.73                   | 8.75            |
| Pasture/ Hay         | 163.64          | 0.26                   | 3.07            |
| Cultivated Crops     | 9.12            | 0.01                   | 0.17            |
| Wetlands             | 0.44            | 0.00                   | 0.01            |
| Totals               | 5333.35         | 8.33                   | 100.00          |

Table F.3 Rock Fork RM 0.0 to 7.0 Data (site 22)

|                               | E. coli<br>(colonies/100 | Flow  | Instantaneous Load (billion <u>E</u> . <u>coli</u> | Unit Area Load (million E. coli |
|-------------------------------|--------------------------|-------|--|---------------------------------|
| Collection Date               | mls)                     | (cfs) | colonies/day)                                      | colonies/day/acre)              |
| 05/16/07                      | 160                      | 5.226 | 20.46  | 3.84                            |
| 05/30/07                      | 70                       | 2.975 | 5.09   | 0.96                            |
| 06/13/07                      | 50                       | 2.315 | 2.83   | 0.53                            |
| 06/27/07                      | 1600                     | 2.025 | 79.27  | 14.86                           |
| 07/10/07                      | 80                       | 1.705 | 3.34   | 0.63                            |
| 07/26/07                      | 1900                     | 1.887 | 87.72  | 16.45                           |
| 08/17/07                      | 60                       | 1.485 | 2.18   | 0.41                            |
| 08/31/07                      | 60                       | N/A   | N/A  |                                 |
| 09/14/07                      | 200                      | 1.924 | 9.41   | 1.77                            |
| 09/28/07                      | 110                      | 0.955 | 2.57   | 0.48                            |
| 10/12/07                      | 100                      | 1.023 | 2.50   | 0.47                            |
| 10/10/07 (0 ) 0 1 )           | 0.0                      | 37/4  | 27/4   | 27/4                            |
| 10/12/07 (QA Sample)          | 90                       | N/A   | N/A  | N/A                             |
| 11/16/07 (outside PCR season) | 600                      | 1.597 | 23.44  | 4.40                            |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

Table F.4 Rock Fork RM 0.0 to 7.0 Sources

| AI<br>number | KPDES#    | Discharger<br>Facility<br>Name | Design<br>Capacity<br>(cfs) | Sic Code                            | Facility<br>Latitude | Facility<br>Longitude |
|--------------|-----------|--------------------------------|-----------------------------|-------------------------------------|----------------------|-----------------------|
| 15655        | KYG401296 | WEBB<br>RESIDENCE              | 0.0007736                   | Dwelling<br>Other than<br>Apartment | 37.474444            | -82.845               |
|              |           | addition to<br>MAF             | 0.0007736                   |                                     |                      |                       |

#### nwealth of Kentucky GI), located in Frankfort, Kentucki Prepared by: t-Section, KDOW 6/28/10 Cities E. coli Sample Sites Right Fork Beaver 23.3 to 30.3 Right Fork Beaver 30.3 to 33.4 Open Water Developed, Open Space Developed, Low Intensity Developed, Medium Intensity Developed, High Intensity WHEELWRIGHT A PASSES CITY Barren Land (Rock,Sand,Clay) Deciduous Forest Mixed Forest Shrub/Scrub MAGOFFIN Grasslands/Herbaceous Pasture/Hay BREATHETT Cultivated Crops Woody Wetlands Emergent Herbaceous Wetlands KPDES-permitted Sources Dwelling other than Apartment Sewerage Systems

# Right Fork Beaver Creek RM 23.3 to 30.3

Figure F.2 Right Fork Beaver Creek RM 23.3 to 30.3

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Right Fork Beaver Creek at RM 23.3 is a fourth order stream located in the Upper Right Fork Beaver Creek subwatershed in Knott County (Figure F.2). Information about Right Fork Beaver Creek RM 23.3 to 30.3, including sample site location, waterbody identification number (WBID), and MAF is shown in Table F.5. It has a catchment of 27,178 acres (42.5 square miles) with an 83% forested and 5.3% developed land cover (Table F6). This subwatershed is unsewered. There are two stream water withdrawals in this subwatershed (Table F.7). Sampling data from site 33 is presented in Table F.8 and KPDES-permitted sources of pathogen indicators are shown in Table F.9. Because this is a fully supporting segment, TMDLs are not calculated.

Table F.5 Right Fork Beaver Creek RM 23.3 to 30.3 Information

| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |          |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|----------|----------|
|        | Right             |           |          |           |                 |               |         |          |          |
|        | Fork              |           |          |           |                 |               |         |          |          |
| Right  | Beaver            |           |          |           |                 |               |         |          |          |
| Fork   | Creek             |           |          |           |                 |               |         |          |          |
| Beaver | 23.3 to           |           |          |           |                 |               |         |          |          |
| Creek  | 30.3              | 501863_03 | Knott    | 27178.24  | 42.466          | 4th order     |         |          |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from   | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF      | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)    | (cfs)    |
| 33     | 33                | 23.4      | 37.4173  | -82.79682 | 58              | 23.3          | 0.01083 | 0.425488 | 57.5853  |

Table F.6 Right Fork Beaver Creek RM 23.3 to 30.3 Subwatershed Land Cover

| Land Cover           | Watershed Acres | Watershed Square Miles | % of Total Area |
|----------------------|-----------------|------------------------|-----------------|
| Open Water           | 11.56           | 0.02                   | 0.04            |
| Developed            | 1436.18         | 2.24                   | 5.28            |
| Barren Land          | 333.14          | 0.52                   | 1.23            |
| Forest/Shrubland     | 22586.82        | 35.29                  | 83.11           |
| Grassland/Herbaceous | 2358.65         | 3.69                   | 8.68            |
| Pasture/ Hay         | 436.55          | 0.68                   | 1.61            |
| Cultivated Crops     | 14.46           | 0.02                   | 0.05            |
| Wetlands             | 0.89            | 0.00                   | 0.00            |
| Totals               | 27178.24        | 42.47                  | 100.00          |

Table F.7 Right Fork Beaver Creek RM 23.3 to 30.3 Water Withdrawals

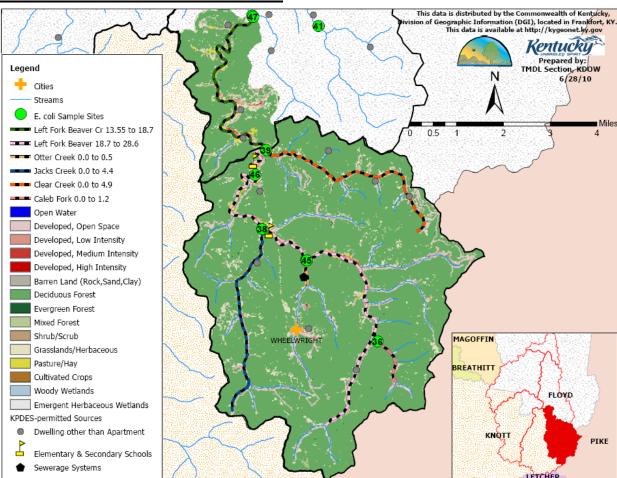
| AI     | Source      | Withdrawal Facility    | Withdrawal | Facility | Facility  |
|--------|-------------|------------------------|------------|----------|-----------|
| number | Description | Name                   | (cfs)      | Latitude | Longitude |
|        |             |                        |            |          |           |
|        | RM 40.6     |                        |            |          |           |
|        | Right Fork  |                        |            |          |           |
|        | Beaver      | ICG Knott Co LLC (860- |            |          |           |
| 2528   | Creek       | 8012)                  | 0.410016   | 37.32166 | -82.80366 |
|        | RM 31.0     |                        |            |          |           |
|        | Right Fork  |                        |            |          |           |
|        | Beaver      | Deane Mining LLC (860- |            |          |           |
| 2525   | Creek       | 5318)                  | 0.015472   | 37.41038 | -82.78096 |
|        |             | subtraction from MAF   | 0.425488   |          |           |

Table F.8 Right Fork Beaver Creek RM 23.3 to 30.3 Data (Site 33)

| Tuote 1.0 Higher one Beaver   | E. coli<br>(colonies/ | Flow     | Instantaneous Load (billion <u>E</u> . coli | Unit Area Load (million E. coli |
|-------------------------------|-----------------------|----------|---|---------------------------------|
| Collection Date               | 100 mls)              | (cfs)    | colonies/day)                               | colonies/day/acre)              |
| 05/15/07                      | 150                   | 431.7758 | 1584.56                                     | 58.30                           |
| 05/30/07                      | <10                   | 11.65    | 2.85  | 0.10                            |
| 06/13/07                      | 120                   | 5.073    | 14.89                                       | 0.55                            |
| 06/27/07                      | 330                   | 4.539    | 36.65                                       | 1.35                            |
| 07/10/07                      | 150                   | 2.844    | 10.44                                       | 0.38                            |
| 07/26/07                      | 2500                  | 20.381   | 1246.59                                     | 45.87                           |
| 08/17/07                      | 100                   | 2.148    | 5.26  | 0.19                            |
| 08/31/07                      | 150                   | N/A      | N/A   | N/A                             |
| 09/14/07                      | 180                   | 2.088    | 9.20  | 0.34                            |
| 09/28/07                      | 10                    | N/A      | N/A   | N/A                             |
| 10/12/07                      | 20                    | N/A      | N/A   | N/A                             |
| 11/16/07 (outside PCR season) | 290                   | 2.4992   | 17.73                                       | 0.65                            |
| 11/16/07 (QA Sample)          | 470                   | 2.4992   | N/A   | N/A                             |

Table F.9 Right Fork Beaver Creek RM 23.3 to 30.3 Sources

| AI<br>number | KPDES#    | Discharger<br>Facility<br>Name    | Design<br>Capacity<br>(cfs) | Sic<br>Code | Facility<br>Latitude | Facility<br>Longitude |
|--------------|-----------|-----------------------------------|-----------------------------|-------------|----------------------|-----------------------|
| 33945        | KY0077542 | BEAVER<br>CREEK<br>ELEM<br>SCHOOL | 0.0108306                   | School      | 37.351111            | -82.812222            |
| 33943        | K1007/342 | addition to MAF                   | 0.0108306                   | SCHOOL      | 37.331111            | -02.012222            |



# Left Fork Beaver Creek RM 13.55 to 18.7

Figure F.3 Left Fork Beaver Creek RM 13.55 to 18.7

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 37 is under site 45, and site 40 is under site 47.

Left Fork Beaver Creek at RM 13.55 is a fourth order stream located in the Upper Left Fork Beaver Creek subwatershed in Floyd County (Figure F.3). Information about Left Fork Beaver Creek RM 13.55 to 18.7, including sample site location, waterbody identification number (WBID), and MAF is shown in Table F.10. It has a catchment of 22,569 acres (35.3 square miles) with an 85% forested and 7% developed land cover (Table F.11). This subwatershed is sewered around the city of Wheelwright (Figure F.4). There is one stream water withdrawal in this subwatershed (Table F.12). Sampling data from site 33 is presented in Table F.13 and KPDES-permitted sources of pathogen indicators are shown in Table F.14. Because this is a fully supporting segment, TMDLs are not calculated.

Table F.10 Left Fork Beaver Creek RM 13.55 to 18.7 Information

| Stream | Stream<br>Segment | WBID#     | County   | Acres     | Square<br>Miles | Stream Order  |         |         |          |
|--------|-------------------|-----------|----------|-----------|-----------------|---------------|---------|---------|----------|
| Sugari | Left              | W 212 11  | County   | 110100    | 1,11165         | Stream State  |         |         |          |
|        | Fork              |           |          |           |                 |               |         |         |          |
| Left   | Beaver            |           |          |           |                 |               |         |         |          |
| Fork   | Creek             |           |          |           |                 |               |         |         |          |
| Beaver | 13.55 to          |           |          |           |                 |               |         |         |          |
| Creek  | 18.7              | 496194_03 | Floyd    | 22568.84  | 35.264          | 4th order     |         |         |          |
|        |                   |           |          |           |                 |               |         |         |          |
|        |                   |           | Sample   | Sample    |                 |               | + to    | - from  | Adjusted |
| EKU    | MAP               | Sample    | Site     | Site      | MAF             | RM of MAF     | MAF     | MAF     | MAF      |
| Site # | Site #            | Point RM  | Latitude | Longitude | (cfs)           | Determination | (cfs)   | (cfs)   | (cfs)    |
| 47     | 47                | 13.55     | 37.42999 | -82.73404 | 48.4            | 13.55         | 0.38959 | 0.09283 | 48.69676 |

Table F.11 Left Fork Beaver Creek RM 13.55 to 18.7 Subwatershed Land Cover

| Land Cover           | Watershed Acres | Watershed Square Miles | % of Total Area |
|----------------------|-----------------|------------------------|-----------------|
| Open Water           | 0.00            | 0.00                   | 0.00            |
| Developed            | 1572.82         | 2.46                   | 6.97            |
| Barren Land          | 205.39          | 0.32                   | 0.91            |
| Forest/Shrubland     | 19203.80        | 30.01                  | 85.09           |
| Grassland/Herbaceous | 1277.08         | 2.00                   | 5.66            |
| Pasture/ Hay         | 282.39          | 0.44                   | 1.25            |
| Cultivated Crops     | 25.81           | 0.04                   | 0.11            |
| Wetlands             | 1.56            | 0.00                   | 0.01            |
| Totals               | 22568.84        | 35.26                  | 100.00          |

Table F.12 Left Fork Beaver Creek RM 13.55 to 18.7 Water Withdrawals

| AI<br>number | Source<br>Description    | Withdrawal Facility<br>Name | Withdrawal (cfs) | Facility<br>Latitude | Facility<br>Longitude |
|--------------|--------------------------|-----------------------------|------------------|----------------------|-----------------------|
|              | RM 15.36 of<br>Left Fork |                             |                  |                      |                       |
| 1299         | Beaver Creek             | Elk Horn Coal Co LLC        | 0.09283372       | 37.40129             | -82.74175             |
|              |                          | subtraction from MAF        | 0.09283372       |                      |                       |

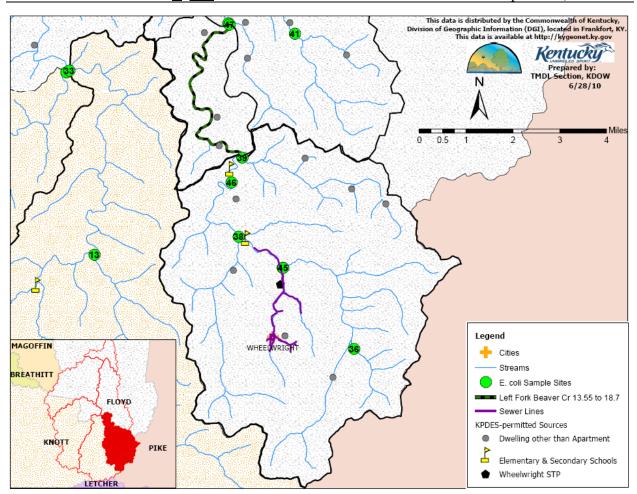


Figure F.4 Left Fork Beaver Creek RM 13.55 to 18.7 Sewer Lines

Note: Due to map resolution, some sites are masked by symbols for other sites. Site 32 is under site 33, site 37 is under site 45, and site 40 is under site 47.

Table F.13 Left Fork Beaver Creek RM 13.55 to 18.7 Data (site 47)

| Tuble 1:15 Left 1 of R Be | E. coli       |        | Instantaneous Load | Unit Area Load                  |
|---------------------------|---------------|--------|--------------------|---------------------------------|
|                           | (colonies/100 | Flow   | (billion E. coli   | (million <u>E</u> . <u>coli</u> |
| Collection Date           | mls)          | (cfs)  | colonies/day)      | colonies/day/acre)              |
| 05/16/08                  | 90            | N/A    | N/A                | N/A                             |
| 05/30/08                  | 300           | 7.0056 | 51.42              | 2.28                            |
| 06/13/08                  | 40            | 4.5576 | 4.46               | 0.20                            |
| 06/27/08                  | 40            | 2.8755 | 2.81               | 0.12                            |
| 07/11/08                  | 10            | 4.733  | 1.16               | 0.05                            |
| 07/31/08                  | 7500          | 26.059 | 4781.65            | 211.87                          |
| 08/08/08                  | 210           | 0.032  | 0.16               | 0.01                            |
| 8/8/08 (QA Sample)        | 250           | N/A    | N/A                | N/A                             |
| 08/22/08                  | 100           | 2.025  | 4.95               | 0.22                            |
| 09/12/08                  | 230           | 6.1594 | 34.66              | 1.54                            |
| 09/20/08                  | 30            | 3.2045 | 2.35               | 0.10                            |
| 10/17/08                  | 130           | 2.695  | 8.57               | 0.38                            |
| 10/24/08                  | 110           | 1.4958 | 4.03               | 0.18                            |

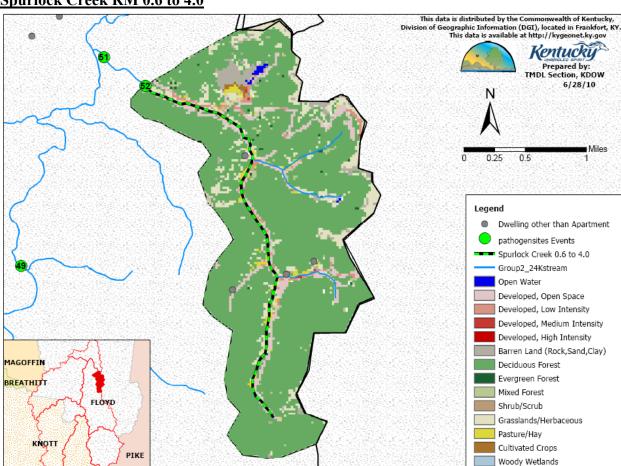
Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

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Table F.14 Left Fork Beaver Creek RM 13.55 to 18.7 Sources

|        |                   |                     | Design    |                |           |           |
|--------|-------------------|---------------------|-----------|----------------|-----------|-----------|
| AI     | ***********       | Discharger Facility | Capacity  |                | Facility  | Facility  |
| number | KPDES#            | Name                | (cfs)     | Туре           | Latitude  | Longitude |
|        |                   | WHEEL-WRIGHT        |           | Sewerage       |           |           |
| 40534  | KY0028789         | STP                 | 0.3481265 | System         | 37.348888 | -82.7175  |
|        |                   | OSBORNE ELEM        |           |                |           |           |
| 35251  | KY0089435         | SCHOOL              | 0.0105212 | School         | 37.363611 | -82.73028 |
| 33231  | K10007433         | BCHOOL              | 0.0103212 | School         | 37.303011 | -02.73020 |
|        |                   | SOUTH FLOYD         | 0.0232084 |                |           |           |
| 35260  | KY0093912         | HIGH SCHOOL         | 4         | School         | 37.385298 | -82.73556 |
|        |                   | MULLINS             |           | Dwelling other |           |           |
| 1274   | KYG400714         | RESIDENCE           | 0.0007736 | than Apartment | 37.427777 | -82.74389 |
|        |                   | BINGHAM             |           | Dwelling other |           |           |
| 1237   | KYG400753         | RESIDENCE           | 0.0007736 | than Apartment | 37.387777 | -82.70639 |
|        |                   | COOK                |           | Dwelling other |           |           |
| 1173   | KYG400790         | RESIDENCE           | 0.0007736 | than Apartment | 37.377777 | -82.68861 |
|        |                   | MEADE               |           | Dwelling other |           |           |
| 1266   | KYG400970         | RESIDENCE           | 0.0007736 | than Apartment | 37.372777 | -82.67556 |
|        |                   | JONES               |           | Dwelling other |           |           |
| 4349   | KYG401133         | RESIDENCE           | 0.0007736 | than Apartment | 37.353611 | -82.73556 |
|        |                   |                     |           | Dwelling other |           |           |
| 4333   | KYG401140         | DYE RESIDENCE       | 0.0007736 | than Apartment | 37.401388 | -82.74    |
|        |                   | MULLINS II          |           | Dwelling other |           |           |
| 74062  | KYG401442         | RESIDENCE           | 0.0007736 | than Apartment | 37.3925   | -82.73944 |
| 74002  | 11 0 10 1 1 1 1 2 | TACKETT             | 0.0007730 | Dwelling other | 31.3723   | 02.137aa  |
| 74181  | KYG401470         | RESIDENCE           | 0.0007736 | than Apartment | 37.319444 | -82.69833 |
| , 1101 | 121 0 101 170     | CAUDILL             | 0.0007750 | Dwelling other | 27.317111 | 32.07023  |
| 44695  | KYG401580         | RESIDENCE           | 0.0007736 | than Apartment | 37.332777 | -82.71639 |
|        |                   | COCHRAN             | 2.000,,20 | Dwelling other | -,,,      | 52.71009  |
| 48897  | KYG401646         | RESIDENCE           | 0.0007736 | than Apartment | 37.375833 | -82.73361 |
|        |                   | addition to MAF     | 0.3895923 | 1              | _         |           |

Emergent Herbaceous Wetlands



# Spurlock Creek RM 0.6 to 4.0

Figure F.5 Spurlock Creek RM 0.6 to 4.0

Spurlock Creek at RM 0.6 is a third order stream located in the Lower Left Fork Beaver Creek subwatershed in Floyd County (Figure F.5). Information about Spurlock Creek RM 0.6 to 4.0, including sample site location, waterbody identification number (WBID), and MAF is shown in Table F.15. It has a catchment of 2,358 acres (3.7 square miles) with a 78% forested and 7.4% developed land cover (Table F.16). This subwatershed is un-sewerd. There are no stream water withdrawals in this subwatershed. Sampling data from site 52 is presented in Table F.17 and KPDES-permitted sources of pathogen indicators are shown in Table F.18. Because this is a fully supporting segment, TMDLs are not calculated.

Table F.15 Spurlock Creek RM 0.6 to 4.0 Information

| 10010111 | e spenie          | R CICCR ICIV | 1 0.0 00  | 11110111100010 |                 |               |         |        |          |
|----------|-------------------|--------------|-----------|----------------|-----------------|---------------|---------|--------|----------|
| Stream   | Stream<br>Segment | WBID#        | County    | Acres          | Square<br>Miles | Stream Order  |         |        |          |
|          | Spurlock          |              |           |                |                 |               |         |        |          |
|          | Creek             |              |           |                |                 |               |         |        |          |
| Spurlock | 0.6 to            |              |           |                |                 |               |         |        |          |
| Creek    | 4.0               | 504191_02    | Floyd     | 2357.79        | 3.68            | 3rd order     |         |        |          |
|          |                   |              |           |                |                 |               |         |        |          |
|          |                   |              | Sample    | Sample         |                 |               | + to    | - from | Adjusted |
| EKU      | MAP               | Sample       | Site      | Site           | MAF             | RM of MAF     | MAF     | MAF    | MAF      |
| Site #   | Site #            | Point RM     | Latitude  | Longitude      | (cfs)           | Determination | (cfs)   | (cfs)  | (cfs)    |
| 52       | 52                | 0.6          | 37.527254 | -82.73617      | 5               | 0.6           | 0.00309 | 0      | 5.00309  |

Table F.16 Spurlock Creek RM 0.6 to 4.0 Subwatershed Land Cover

| Land Cover           | Watershed Acres | Watershed Square Miles | % of Total Area |
|----------------------|-----------------|------------------------|-----------------|
| Open Water           | 5.16            | 0.01                   | 0.22            |
| Developed            | 175.07          | 0.27                   | 7.43            |
| Barren Land          | 67.47           | 0.11                   | 2.86            |
| Forest/Shrubland     | 1848.93         | 2.89                   | 78.42           |
| Grassland/Herbaceous | 220.13          | 0.34                   | 9.34            |
| Pasture/Hay          | 35.87           | 0.06                   | 1.52            |
| Cultivated Crops     | 4.71            | 0.01                   | 0.20            |
| Wetlands             | 0.45            | 0.00                   | 0.02            |
| Totals               | 2357.79         | 3.68                   | 100.00          |

Table F.17 Spurlock Creek RM 0.6 to 4.0 Data (site 52)

| Tuble 1:17 Spullock C |                          | (      |  |   |
|-----------------------|--------------------------|--------|--|---|
|                       | E. coli<br>(colonies/100 | Flow   | Instantaneous Load (billion <u>E</u> . <u>coli</u> | Unit Area Load (million <u>E</u> . coli |
| Collection Date       | mls)                     | (cfs)  | colonies/day)                                      | colonies/day/acre)                      |
| 05/16/08              | 10                       | 2.113  | 0.52   | 0.22                                    |
| 05/30/08              | 110                      | 0.498  | 1.34   | 0.58                                    |
| 06/13/08              | 30                       | 0.538  | 0.39   | 0.17                                    |
| 06/27/08              | 20                       | 0.721  | 0.35   | 0.15                                    |
| 07/11/08              | 110                      | 0.832  | 2.24   | 0.96                                    |
| 07/31/08              | >80000                   | 13.349 | 26127.47   | 11249.59                                |
| 08/08/08              | 60                       | 0.1285 | 0.19   | 0.08                                    |
|                       |                          |        |  |   |
| 8/8/08 (QA Sample)    | 40                       | N/A    | N/A  | N/A                                     |
| 08/22/08              | <10                      | 0.072  | 0.02   | 0.01                                    |
| 09/12/08              | 70                       | 0.801  | 1.37   | 0.59                                    |
| 09/20/08              | 20                       | 0.601  | 0.29   | 0.13                                    |
| 10/17/08              | 30                       | 0.633  | 0.46   | 0.20                                    |
| 10/24/08              | <10                      | 0.505  | 0.12   | 0.05                                    |

Final Beaver Creek Watershed <u>E</u>. <u>coli</u> TMDL

Table F.18 Spurlock Creek RM 0.6 to 4.0 Sources

| AI<br>number | KPDES#     | Discharger<br>Facility Name | Design<br>Capacity<br>(cfs) | Туре                                | Facility<br>Latitude | Facility<br>Longitude |
|--------------|------------|-----------------------------|-----------------------------|-------------------------------------|----------------------|-----------------------|
| 1315         | KYG400677  | SHREWBERRY<br>RESIDENCE     | 0.0007736                   | Dwelling other than Apartment       | 37.504444            | -82.71611             |
| 1162         | KYG400678  | CASTLE<br>RESIDENCE         | 0.0007736                   | Dwelling other than Apartment       | 37.518611            | -82.72167             |
| 1161         | KYG400692  | CASE<br>RESIDENCE           | 0.0007736                   | Dwelling other than Apartment       | 37.505833            | -82.71194             |
| 46144        | KYG401601  | WILLIAMSON<br>RESIDENCE     | 0.0007736                   | Dwelling<br>other than<br>Apartment | 37.502777            | -82.72417             |
| 70177        | K1 G401001 | addition to MAF             | 0.0030945                   | 1 partinent                         | 51.502111            | 02./271/              |